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THE SURGEON IN THE MAKING*

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NASHVILLE, TENN.

If the past thirty years in medical education and hospital standardization are briefly reviewed, the two features that appear outstanding are the decrease in medical schools and the tremendous increase in the number of hospitals. The significance of this increase from the point of view of the student is made plain in the following quotation from the report of the Committee on Medical Education and Hospitals of the American Medical Association:

> The 624 approved hospitals provide 5,409 internships, more than enough for all graduates. Your committee believes that unless the investigations of the inspectors include the quality and quantity of clinical teaching by the staff, appraisal of the value of an internship in any hospital will be inadequate. Many large adequately equipped, well managed hospitals with excellent staffs offer very poor internships because the staff members cannot or will not give the interns sufficient clinical teaching.

The essential to be desired in the training of the young surgeon is surgical judgment. As expressed by T. F. Thornton, "The surgeon who knows when and when not to operate and how much the patient can stand, who knows what is pathologic and what is not, and who has the courage of his convictions and a high conception of his duty has acquired the art of surgical judgment." It behooves the medical profession as a whole to see that the surgeon in the making is properly trained before appearing before special examining boards. The finished product must have surgical judgment. He must be well rounded in medicine and pathology and ambitious to help humanity.

To me the high cost of medical care is one of the greatest economic problems confronting our profession today and is worthy of consideration in the training of the future surgeon. This high cost is the result of the increase in hospital expenses and the number of new methods which are necessary to confirm or establish our diagnoses. Twenty years ago these methods were unknown or untried, and practically all diagnoses were made from the clinical observations. Today the clinical observations are still the most important feature, but it is indeed comforting to confirm or amplify these with other and more precise methods.

Surgery is the active branch of medicine, active in the sense that it does something entailing risk for the patient; hence, a large element of surgical success must depend on the accuracy of the preoperative information. It is not necessary to emphasize this, as no doubt most of us can recall a few cases in which operations would never have been performed had we known as much about the patient before operation as after. Suffice it to say that accurate diagnosis is more important in our field than in any other. It is this conflict between accuracy and expense, or, better, the high cost of accuracy, that I wish to consider in some detail. It frequently happens that the patient's resources are exhausted in bringing together all the available information. Generally the surgeon has to depend on others for much of this.

In the last twenty years the diagnostic aids have made great advances. These subjects were omitted in the medical courses of many of our present practitioners. Therefore, because most of us were untrained in these fields, a host of specialists have sprung up over night in order to do what we could not. As specialists they were entitled to large fees and an easier life. This was attractive to many, and the field became more crowded and fees mounted.

From the foregoing I do not wish to be understood as condemning specialization. I consider specialization necessary for progress. I do consider, however, that we have entirely too many specialists and that a great deal of work is now being done by specialists which should not require their services. Specialists should be self sufficient unto themselves. It is of course impossible for the busy surgeon with a large practice to supervise personally every detail in the collection of information about a given patient. He will probably recall, however, several years in which his work was not so plentiful and when time for such personal studies was ample. It cannot be gainsaid that the truest evaluation of a diagnostic aid comes from understanding its sources of error. Such information is best obtained by actual work with the method.

It seems to me that the problem of training the future surgeon to meet this economic situation is a major one in medical education, and to my knowledge not heretofore attempted on any large scale. I hope to see the time when medical schools will equip certain conveniently located rooms with all the apparatus and materials which the future physician will require in practice. In the course of his clinical work the student should be taught to be so self sufficient that no matter where he locates he can make modern diagnoses in his own office and with as good results as in the larger cities. Large numbers of graduates have not so much as performed even the simplest of the chemical tests of the blood or pressed the button of an x-ray machine before graduation. It is this ignorance of technic that makes practitioners dependent on others. The remedy is a greater opportunity to become familiar with these methods. Their technic is usually exceedingly simple and should not require much time or brains to master.

* President's address, read before the Southern Surgical Association, Atlanta, Ga., Dec. 10, 1929.

The great discussion in medical education in the past few years has been over the relative merits of the full-time system and the part-time system. Before delving into this much mooted question I should like to make my own position clear, and I shall perhaps be pardoned if I say that I feel I am in a position to draw an impartial opinion regarding this matter.

The Vanderbilt University School of Medicine has full-time men as chiefs of all the clinical subjects except my own; I therefore feel that four years' close association with full-time men and a full-time system has given me a rare opportunity to study the problem. I must confess that I feared the full-time men would be more scientific than practical. I gradually discovered that they were practical scientists, excellent clinicians and skilled operators. The full-time man has come to stay and the scientific background that is given to the students by him is most important and is the foundation on which the advances of the future must rest. Let this foundation be solid.

The attending staff, however, is just as important in a medical school as a full-time staff. It comprises practical teachers who can give the students many valuable points that will be of incalculable value in their future work as private practitioners. The men of the attending staff are also a worthy asset to the school in keeping up public interest in the institution. They are in daily contact with the community; they know the community's likes and prejudices, and it is natural that the public should look to them as pilots or guides. It is the attending clinicians as a rule, and not the full-time men, that make a community a medical center. For this reason no institution of learning can flourish without outstanding attending clinicians. The heavily endowed institutions should have sufficient beds, both free and private, for both the attending clinical and the full-time staff. Then both staffs can work in harmony and the students, the patients and the public will be benefited by their united efforts.

For the full-time man, one can say nothing except that which is praiseworthy. For the full-time system as it exists in certain institutions there are a few minor points that can be easily corrected. It is a weakness to place a man on a full-time basis and make him turn over to the hospital the fees he collects from private patients in that institution. This places the school with all its prestige in competition with its own alumni and creates an unfriendly feeling. Without the support of the alumni, no institution can flourish.

It would be a wise move for the full-time men to receive sufficient salaries in order that they might devote their whole time to clinical work in the wards and to teaching and research. This would insure their financial independence and relieve their minds from the worries of private practice. Another unsatisfactory custom that exists in a few hospitals is to limit the maximum fee an attendant may receive. A lay board of hospital managers is not competent to say how much a member of the staff may charge for his professional skill. The legal profession is often awarded proper compensation by the courts of justice for saving clients large sums of money, and yet our profession is sometimes hampered in receiving an adequate fee for saving the life of a man of large means. The limit of this fee is not half as much as a devoted parent pays for his son's automobile or his daughter's fur coat. Designing patients with large fortunes often take advantage of the profession at large where this rule exists.

The problem of the surgeon in the making is not a simple one. I believe it to be more complicated than that of the making of any other professional man. I was formerly of the opinion that the medical school the student attended played a great part in his future career, and I still hold that it does to a considerable extent and that he should exercise great care in the school he selects. At the present time most medical schools are good; some, however, are better than others and offer greater facilities for learning. During the war I came in close contact with graduates from almost all the schools in the country, and soon discovered that it was not the medical school so much as the hospital in which the young officers had been trained that developed their professional ability.

The question that naturally arises in the mind of the future surgeon is, What is the best method of securing proper training after graduation? Some authorities advise a year or two years of hospital training, followed by general practice, gradually working into surgery. Others think it best for the young surgeon after the completion of a short period of training in a hospital to start out for himself in his specialty, and assist some established surgeon in the community. Other authorities advise the coming surgeon to get all his training in a good hospital. No doubt an efficient surgeon may be trained by all three methods. The first plan gives the young man an opportunity to make a living in general practice and this will appeal to many. It has one insurmountable objection—he is compelled to train himself. The second plan also offers the coming surgeon an opportunity to make a living and at the same time to work under an established surgeon. In a few isolated instances this may work out well, but in the great majority of cases it will not.

The young surgeon working under the second plan will not have an opportunity to study the cases as they should be studied before and after operation, and laboratory and scientific training will not be available. He may become a good technical surgeon but not a well trained one. I would consider it a progressive move on the part of the American College of Surgeons and the special examining boards to require at least three years of hospital work before a candidate can appear before them for consideration. If a three year hospital training was required by these bodies, it would compel the staffs of the recognized hospitals to devote more time to the training of the house staff.

The plan that I desire to present here—a plan that I am about to inaugurate in my own service—is as follows: After graduation a one year service in medicine should be required in every good hospital. No one can become a good surgeon unless he has received medical training, and nothing will be of greater service to him in his future life than this year in medicine. A second year of training should be spent in the department of pathology. Here the young surgeon will refresh his anatomy; the postmortems will teach him that disease often involves many organs and this, of course, will broaden his vision. This year will also give him an added stimulus for appreciating the scientific side of surgery. The third, fourth and fifth years are to be spent in the wards, laboratories and operating rooms of the department in which he desires to specialize. This training should produce a man of broad vision and scientific attainments, a good physician, a promising pathologist, well versed in technic, and, last but not least, one well developed in surgical judgment.

2112 West End Avenue.

RESEARCH IN TUBERCULOSIS*

KENDALL EMERSON, M.D.
NEW YORK

The National Tuberculosis Association is engaged in research work directed by two committees, one for social research, the other for medical research. The work of the Committee on Social Research is done largely through the granting of fellowships to special students for study of specific problems presented by the social and economic phases of tuberculosis work. Such fellowships are granted through universities and the work is done under the supervision of a professor of sociology experienced in the direction of research study.

The Medical Research Committee is pursuing investigations in three important fields: the study of light, which is being developed by Mr. W. R. Earle of Dr. Cunningham's group at Vanderbilt University; a study of the history of infants in tuberculous and nontuberculous environments, undertaken by Dr. E. A. Park at the Harriet Lane Clinic of Baltimore, and studies in the biochemical analysis of the tubercle and other acid-fast bacilli with the effect of their various components on the live animal cell. The latter phase of the work involves the cooperation of numerous district laboratories, each engaged on the phase of the work which, through its personnel, it is specifically equipped to perform.

In this paper I will consider in detail only the latter division of the research work in progress; namely, that dealing with the analytic study of bacteria. Laboratory work on the tubercle bacillus started immediately after the discovery of the micro-organism by Robert Koch. Efforts to develop an effective antitoxin for the disease somewhat cooled the ardor of the early investigators until, writing in 1921, Gerald Webb pointed out that there were scarcely a score of laboratories in the entire world actively engaged in research work on tuberculosis.

It was about that time, however, that the fact was recognized that there could be little hope of further progress in our knowledge of the disease and little change in treatment until investigation of the bacillus itself was vastly extended along chemical and biologic lines. Such a study required a very different approach from that current in past investigations. Research in the chemistry of the living organism and concurrently of the physiologic effects of the chemical fractions derived from splitting the bacillus into its simpler constituents required far more in equipment and personnel than could be found in any single laboratory or any series of laboratories at a single university.

In each field of this highly specialized and technical research, however, one locality and usually one individual alone was preeminently equipped to carry on productive investigations. This, then, was the problem for the consideration of the Committee on Medical Research of the National Tuberculosis Association. It was met by the difficult but eminently sensible plan of interesting a now considerable number of men and women, outstanding specialists in individual fields, in attacking the study under a cooperative plan. By this method, intensive research in various phases of this work is carried on in twenty-one different laboratories, each under the guidance of a specialist in the particular field of study involved. The results are correlated by frequent conferences between these experts and by the tireless efforts of the chairman of the Research Committee.

In describing the plan, it is not necessary to adhere strictly to the chronology of the enterprise as thus far carried out. In general, the plan is as follows: After considerable experimenting with limited quantities of bacilli, it was found that to secure enough material for thorough work the bacilli themselves must be manufactured in much larger quantities. In order to accomplish this in such a manner as to make the results in different localities comparable, it was essential to have complete standardization of products. To achieve this, a synthetic medium for the growth of the bacteria was the first requisite. This must be composed of chemically pure ingredients of exactly known quantities and prepared under similar laboratory conditions with the use of the same varieties of glass and apparatus.

Dr. Esmond R. Long of the University of Chicago worked out the necessary formulas to insure this essential uniformity of raw material. Through the courtesy and generosity of H. K. Mulford & Co. and of Parke, Davis & Co., the manufacture of bacilli in quantity was then undertaken. This has progressed most satisfactorily and the necessary supply of such raw material is now at hand for the research workers in these various laboratories.

Research is carried on both with the bacteria grown and with the known synthetic medium in which such growth occurs, the latter to determine the chemical changes occurring in the course of development of the bacilli. The bacterial residue, after the removal of the medium in which the bacteria have grown, is then split into its fat, sugar and protein fractions and these in turn are studied under the direction of those men best equipped to handle the specific problem presented by each.

As the simpler fractions have been developed, the next step was to submit them to the biologist for experimental research as to their effect on the living organism. Up to the present time, five varieties of bacilli have been thus produced and are being subjected to analysis and test—the human tubercle bacillus H37, the bovine, avian, nonspecific timothy grass and lepra bacilli.

The progress of the work may best be shown by reference to the report of the Research Committee recently published, from which the following quotations are taken:

> The bacteria are grown in units of 2,000 one-liter bottles containing 200 cc. of the medium on which the strain of bacillus to be studied is planted. The cultures are allowed to mature in a room about 8 feet square, which serves as an incubator. At the end of about six weeks, when the bacteria have attained full growth, they are filtered off under carbon dioxide gas to prevent oxidation. The bacterial residue is put into ether-alcohol saturated with carbon dioxide, while the filtrate is precipitated by various methods. The bacteria are then shipped to Sterling Chemistry Laboratory at Yale University and the filtrate to the Department of Pathology of the University of Chicago, where they are subjected to further chemical fractionation. From the two last mentioned laboratories the resulting fractions are sent to the office of the Research Committee for distribution to other chemists and biologists.

The analysis of the bacterial residue is done under the direction of Dr. Treat B. Johnson and Prof. R. G. Anderson of Yale as follows:

> The bacterial residue from the manufacturing pharmacists is analyzed chemically to isolate from the whole and identify, if possible, each minute chemical constituent. Every device

* Read before the Section on Preventive and Industrial Medicine and Public Health at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 11, 1929.

known to modern science is used in the effort to isolate pure fractions. That there be no contamination is essential to the success of the work, and when the biological tests indicate a positive reaction from a fraction it is often necessary for the chemists to refine again and again. It is because of the constantly decreasing quantity of material in the process of refinement that the committee was obliged to appeal to the commercial laboratories for assistance in producing the bacteria in quantities large enough to supply the needs of the chemists and biologists.

The filtrate is sent to Dr. Esmond R. Long, professor of pathology at the University of Chicago, where a careful chemical analysis is carried out with the same minuteness as that practiced in the case of the bacterial residue itself. The fractions resulting from this analysis are tested for their biologic action, and their purity is guided by such biologic tests.

Under the direction of Dr. Florence R. Sabin of the Rockefeller Institute for Medical Research, biologic testing of fractions is carried on:

The object of the whole plan of procedure is to find, if possible, the chemical substances in the tubercle bacillus which are responsible individually for the various phases of the tuberculous process in the animal body and to proceed from this to develop forms of treatment that will neutralize the evil effects of certain of the fractions of the bacillus while it lives in the body. Obviously the chemical analysis is more or less wasted unless the substances isolated have some definite biological property. Therefore, an essential part of the work is the careful biological study of these substances. The biological test, in addition to its own scientific value, acts as the guide to the chemist, indicating to him lines of work that must be pursued in further analysis and purification.

Coincident with the chemical and biologic research, a clinical study is made of such fractions to test their practical value. This work is under the direction of Dr. David R. Lyman of the Gaylord Farm Sanatorium, Wallingford, Conn.

At Dr. R. S. Cunningham's laboratory at Vanderbilt University, exhaustive researches into the effect of the tubercle bacillus on the living cells are being prosecuted:

The refinement by many workers during the last few years of methods for handling living cells, and the fact that tuberculosis is finally a problem of the living chemistry of the tubercle bacillus in symbiotic existence with the living chemistry of body cells, have led to an attempt to study the influence of various substances on the types of cells composing the body, especially their influence on the monocyte which has so many characteristics in common with the epithelioid cell in which the tubercle bacillus grows, for it would seem essential to know how these body cells act under normal and disease conditions if we expect to control tuberculosis efficiently. This study, begun in 1924 at Johns Hopkins University, has continued at Vanderbilt.

Recently, there has been undertaken at Cornell University Medical College under the direction of Dr. Eugene F. Du Bois and Dr. Paul Reznikoff a study of the microchemistry of living cells and the comparative respiration rates of bacteria and their host cells:

Supplementing Dr. Cunningham's work a comparative record of the respiration rate of the living tubercle bacillus and other body cells, both before and after infection with tubercle bacilli, is being made using apparatus perfected by Professor Warburg of Germany. The medium which is being used for the growth of all the organisms is being broken up and small amounts of the bacillus are planted on this modification and the respiration record in each instance is noted in the hope of explaining the different influences affecting the life of the cell. Associated with this study is another, a supplementary biological study of the life history of the tubercle bacillus. A single organism is isolated and the changes which take place in the development of increasing numbers of the organisms are observed in picturing the birth, growth and death of the bacillus.

Before the research work of the association had begun, five men presented to it five hundred dollars to facilitate the work which Dr. William Snow Miller at the University of Wisconsin was doing on the anatomy of the lungs and tubercles that form in the lungs because they are the chief seat of tuberculosis. From that time on the association has continued to support this study on the physical structure of developing tuberculosis.

Drs. Ross G. Harrison and George A. Baitsell at the Osborn Zoological Laboratory of Yale are carrying on a study of scar tissue in healing tuberculosis:

On account of the constant association in healing tuberculosis of so-called scar tissue and the confused knowledge which was available of the conditions under which the fibrils of connective tissue are formed, Dr. Harrison and Dr. Baitsell undertook to study the formation and development of fibrils of connective tissue in living growing animals uninfluenced by the tuberculous process, and a further comparative study of their formation and development in relation to the *tuberculous* structure. It would now appear that the finer chemistry of the development of the fibrils in the ground substances and fluids of the body has many points in common with the fibrillation of gelatin and blood clotting. For this reason advice has been sought from chemists of the Eastman Kodak Company and other industries dealing with the various conditions of fibrillation with the hope of finding a way to pursue the problem further.

Meanwhile, at the University of Nebraska Agricultural College, Dr. L. Van Es is studying the distribution of avian tuberculous infection in mammals other than swine:

Among the many difficulties which those interested in tuberculosis have to face is the rise and fall of tuberculosis in different animals and in groups of humans at different periods in the world's evolution; for instance, the rise of chicken tuberculosis at the same time that bovine tuberculosis is being suppressed; the rise in pig tuberculosis in the same period; and the appearance of articles calling attention to the presence of avian tubercle bacilli in some human cases and in other animal lesions.

An encompassing study to solve the problem of the presence of avian tubercle bacilli in man, which Dr. Van Es was directing, suggested the possibility of helping him. For the past year, through the cooperation of Dr. Long and one of his medical students, Dr. Van Es has been supplied with postmortem material from hospitals, abattoirs, morgues, etc., with the expectation that the completion of this research will determine the importance of the avian tubercle bacillus in human infection.

In addition to this direct research on the biochemistry of the bacillus, three important pieces of research work should be mentioned. At Johns Hopkins Hospital under the direction of Dr. E. A. Park, a careful study is being made of tuberculosis in infancy.

To any one looking at a statistical chart, the importance of the first five years of life in tuberculosis will be apparent. So little accurate data, however, are available in this field that, with the cooperation of Dr. Park and Dr. Ethel C. Dunham at the Yale School of Medicine, a study of babies born of tuberculous and nontuberculous parents was begun, keeping track of them from the first day of life as long as it was possible to keep them under observation. On the appointment of Dr. Park to the staff of Johns Hopkins Hospital, arrangements were made with the Maryland Tuberculosis Association to help continue this study in Baltimore with wider application.

At the Henry Phipps Institute, under Dr. Eugene L. Opie, studies in the field of childhood tuberculosis are in process:

In 1923, the association made a grant to Dr. Opie for the pursuit of his important study of latent tuberculosis (that is,

the possibility of developing tuberculosis) while he was professor of pathology at Washington University in St. Louis. When, shortly thereafter, Dr. Opie removed to the Henry Phipps Institute, he requested that the grant be discontinued but that the contribution which he was making to tuberculosis, especially to childhood tuberculosis, would be in no way interrupted.

At the University of California under Ernest L. Walker there was carried on during 1921 and 1922 a research into the therapeutic value of chaulmoogra oil. This investigation was based purely on theoretical suggestion, but it seemed wise to determine whether this oil of such known potency in the treatment of leprosy might have value in the treatment of tuberculosis. After careful study, Dr. Walker made two scientific reports which determined that chaulmoogra oil had no therapeutic value in the treatment of tuberculosis, and at his suggestion the grant for this study was discontinued.

CONCLUSIONS

It would be premature to state that this laboratory system of interrelated research had as yet produced results of startling value. The work done is in itself a justification for the effort expended, since much of it is pioneer investigation in fields heretofore but little explored and by methods of such careful standardization as to render unnecessary the repetition of much time-consuming and painstaking research on the part of future investigators.

A definite by-product of this research is the evidence which it presents of the tremendous value of cooperation on the part of specially equipped laboratories and specially trained personnel in a combined attack on a chemical and biologic problem of unusual difficulty. So far as the comparative analysis has progressed, certain facts have been revealed:

1. A specific reaction has been found from the introduction into a normal animal of the pure protein substance isolated both from the bacillus itself and from the medium on which it was grown.

2. An entirely different result has been found from the introduction of a fat fraction from the bacillus into a normal animal. It has been shown that this fraction is a stimulus to the growth of one of the cells of the body, the monocyte in which the tubercle bacillus grows. This cell is stimulated to growth far beyond that of the other cells of which the animal body is made up, and this fact is important biologically beyond its influence in tuberculosis.

3. The polysaccharides of the human tubercle bacillus have been shown to possess a killing power for tuberculous animals and, as every tuberculin contains these polysaccharides, this fact becomes of great importance.

The work, although now pursued for a number of years, may still be considered to be in its infancy. Whither it leads, it would be idle to speculate. I believe it is no breach of confidence to say that in a recent statement to me Dr. Sabin remarked that she did not know when she had been so deeply thrilled as by the possibilities of this extensive study and the results toward which it might be leading.

SUMMARY

1. The work here described is a study of the chemical analysis of bacteria and the physiologic effects of the chemical fractions into which the bacteria may be split.

2. It is based on the growth of acid-fast bacilli on a synthetic medium composed of chemically pure ingredients of accurate standardization.

3. A significant feature of the work is the cooperation of a number of widely separated laboratories, each equipped to attack a special phase of the problem.

4. A chemically pure tuberculin has been produced. Specific reactions have followed the introduction into normal animals of the pure protein substances, isolated from the bacillus and also from the medium. A different result has followed the introduction of fat fractions into the normal animal. The polysaccharides of the human bacillus have been shown to possess a killing power for tuberculous animals.

5. The work is to continue under the present plan.

52 Gramercy Park, North.

ABSTRACT OF DISCUSSION

DR. W. D. SANSUM, Santa Barbara, Calif.: So far as I know, no such study has ever been made on any type of bacteria. It seems to me that such fundamental work would be of great value not only in the study of tuberculosis but in the study of all types of infectious diseases. We know very little about the chemistry of any type of infection.

DR. H. J. CORPER, Denver: I know Dr. Emerson will join me in the view I take in regarding this wonderful work as a heritage of Trudeau. In 1884, Dr. Trudeau founded his pioneer sanatorium for tuberculosis in this country. In 1894, Dr. Trudeau was pictured in the laboratory, one of his hobbies, working with tuberculin. Probably all have seen this picture, of which he was fond because of his love for experimental work. In 1904 it was his inspiration that led to the organization of the National Tuberculosis Association and he was fittingly made its first president; as is well known this year we celebrated the twenty-fifth birthday anniversary of the association that has accomplished so much in this short interval. In 1917 another historic step was taken in formulating plans for the launching of the *American Review of Tuberculosis*. The first issue appeared in March, 1917. Dr. Allen K. Krause, one of our foremost students of this subject and a pupil of Dr. Trudeau's, is its editor. This is the only tuberculosis journal on this continent, and at present it surpasses in all its phases any journal in the world on the subject of tuberculosis. In 1920, the National Tuberculosis Association approved of animal experimentation conducted under proper supervision, and urged the further development of research in tuberculosis to the end that a greater knowledge of the means of prevention and treatment may be obtained. This was presented on behalf of the Committee on Resolutions by Dr. Gerald B. Webb, chairman, and was adopted unanimously. Time will permit only a few remarks on the practical aspects. To the users of tuberculin Long's spermatocyte reaction means a standard preparation based on quantitative evaluation. Likewise a crystalline tuberculin and a quantitative chemical test presented by Seibert means clinical purity. And we have not closed the door to the possibility of developing at least a relative immunity under certain circumstances, if we are to believe the views just expressed by Rich and McCordock (*Bull. Johns Hopkins Hosp.* **44**:273 [May] 1929). To those interested in prevention, Opie's studies open a new vista in demonstrating conclusively the endemic contagiousness of tuberculosis. Treat B. Johnson and his co-workers have given us an insight into the *bausteine* of the tubercle bacillus such as has never before been given and William Snow Miller has built for us a conception of the lung tubercle which will dare a genius to improve on. The bacillus and the tubercle are both being scrutinized and torn asunder. Truth, though lying deep, is being brought to the surface to yield that most longed for result, economic value, not in the financial but in the practical sense.

DR. KENDALL EMERSON, New York: I want to express once more the fact that I should regret more than anything else that any one had gained the idea that the National Tuberculosis Association felt it either had any exclusive right in the field of research or was doing all the research that was being done. We are all familiar with the extraordinary work being done in Denver, California and Portland. It is the type of

cooperative effort, such as I have tried to describe, on which emphasis should be placed. Up to the present time Dr. White has been unable to marshal more of the cohorts working and fighting the battle of tuberculosis in the laboratory, but we are hoping that with this study may be coordinated the magnificent efforts which are being put forth in laboratories other than those I have mentioned.

DIRECT IRRADIATION OF THE KIDNEY

A MEANS OF CONTROLLING IDIOPATHIC HEMATURIA *

BENJAMIN H. HAGER, M.D.
LOS ANGELES

The utilization of roentgen therapy for the cure of renal diseases is not new. For many years it has been used empirically following nephrectomy for malignant conditions when there has been some doubt about the complete extirpation of the tumor tissue. Likewise, when the extent of involvement of the growth and the general condition of the patient have precluded surgical intervention, roentgen therapy has been looked on as the last resort.

The results have not always been in agreement. Mann's [1] experience leads him to conclude that cure of malignant growths of the urinary tract by high voltage roentgen therapy is an infrequent occurrence. Unfortunately, as one reviews the records of many instances in which roentgen therapy has been instituted, it becomes difficult to evaluate the results, as there is no means of determining whether or not irradiation has been adequate. This is further complicated by the fact that only those cases which are unsuited for any other form of treatment are relegated to the radiologist. In those cases in which the life expectancy is so short as to permit of nothing more than palliative treatment, the procedure is hardly more than a placebo and a clinical interpretation of the results of irradiation is of no significance. I am fortunate in being able to review briefly the results of two cases of renal malignant conditions treated by high voltage roentgen therapy, and to deduce from the patients' behavior to irradiation a possible application of the procedure to certain cases of idiopathic renal hematuria.

REPORT OF CASES

CASE 1.—A man, aged 31, was seen at the California Hospital in consultation with Dr. J. Walter Reeves, September 6, 1922, because of a tumor mass in the left upper portion of the abdomen, which was accompanied by pain. The family history was irrelevant except that the grandfather died of cancer of the stomach. The patient had been well and robust until nine months previously, when he suffered from an attack of acute pain in the left upper portion of the abdomen, associated with fever. These symptoms lasted about a week and he suffered from several similar spells, without fever, lasting about four days. During the last two months there has been constant pain. He has lost about 20 pounds (9 Kg.). There have not been any digestive disturbances, and there has been no urinary frequency.

The general examination was negative except for a palpable mass in the upper left quadrant of the abdomen. This was hard and nodular and extended backward along the margin of the ribs. The mass was only slightly movable and measured approximately 8 by 10 cm. The blood Wassermann reaction was negative. The blood count and urinalysis were normal. Roentgenograms of the gastro-intestinal tract and the areas of the kidneys, ureters and bladder were negative. A cystoscopic examination revealed a normal bladder; both meatuses appeared normal, with clear urine spurting from each side. Both ureters were catheterized and drained clear urine. A differential test with phenolsulphonphthalein was done. The dye appeared from the right side in four minutes and from the left side in eight minutes, with a concentration of 25 per cent from the right, and 8 per cent from the left in fifteen minutes. A pyelogram of the left kidney showed the characteristic deformities of hypernephroma.

An exploratory anterior incision revealed an inoperable postperitoneal tumor. A small section was removed from the mass for biopsy, and the pathologic report was that of hypernephroma. Ten days following the operation, high voltage roentgen treatments were instituted. The tumor gradually disappeared and at the end of two months was no longer palpable. Repeated check-up examinations have not shown a return of the growth. A letter from Dr. Costolow of the Soiland Clinic states that the total amount of radiation given was as follows: voltage, 220 kilovolts; distance, 53 cm.; filter, 1 mm. of copper and 1 mm. of aluminum; current through tube, 4 milliamperes; surface exposed, 15 by 15 cm. over the left kidney area; total time of exposure, ninety minutes anterior and ninety minutes posterior—thirty minutes given every other day.

At my request the patient presented himself, March 29, 1929, six and one-half years following treatment. At this time he was well nourished, weighing 165 pounds (75 Kg.), and the general examination was essentially negative. There were no abdominal masses palpable. The blood pressure was 100 systolic and 60 diastolic. Urinalysis showed a specific gravity of 1.008. Tests for albumin and sugar were both negative, and the urine sediment was negative microscopically. The intravenous phenolsulphonphthalein return was 65 per cent in two hours. A roentgenogram of the chest was negative and also a roentgenogram of the areas of the kidneys, ureters and bladder.

The salient feature of this case is that of bona fide hypernephroma, identified by biopsy, which has been caused to regress and apparently be rendered inactive as a result of high voltage roentgen treatment. The second point of importance is that after a lapse of six and a half years from the time of roentgen therapy there is no clinical evidence of nephritis.

CASE 2.—L. E. W., a man, aged 44, was seen, Jan. 4, 1926, because of hematuria. Three months previously he had first noticed blood in the urine. At first the entire urine was mixed with blood and at another time terminal bleeding had been noticed.

There had not been any bleeding three weeks previous to his visit. The hematuria complained of was independent of renal pain. The general examination was essentially negative. There were no palpable abdominal masses. There was a small left varicocele. The prostate was normal. The first and second specimens of urine were clear. On cystoscopic examination the posterior urethra and bladder neck were normal. The bladder mucosa was normal except for a small area of vascular congestion about 1 cm. in diameter just medial to the left meatus. Clear spurts of urine were seen from both meatuses. The vascular area referred to was lightly electrocoagulated.

March 1, approximately three months later, a second cystoscopic examination showed distinct hemorrhagic urine coming from the left meatus. The patient was again urged to have a complete kidney study made, but he refused again to submit to the recommendation. September 10, six months later, he was admitted to the hospital because of acute urinary obstruction. He stated that during the past six months he had had repeated attacks of severe and prolonged hematuria. He had also become aware of a swelling in the left side. There was no weight loss and no pain referable to the kidneys. A cystoscopic examination at this time showed the bladder filled with old and recent blood clots. After these had been aspirated, distinct bleeding could be seen coming from the left meatus. A catheter was passed up the left ureter a normal distance with drainage of bloody urine. A roentgenogram of the areas of the kidneys, ureters and bladder was negative for opaque shadows. A left pyelogram showed the classic deformity of renal neoplasm. At this time the tumor was distinctly palpable through the abdomen. The

* Read before the Section on Urology at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 10, 1929.

1. Mann, L. T.: Results of X-Ray Therapy of Malignant Growths of the Urinary Tract, Surg. Gynec. Obst. **43**: 529-534 (Oct.) 1926.

patient was referred to Dr. Soiland for roentgen therapy and was given three courses of roentgen treatment. The mass was decreased to about one-half the original size. Following the roentgen therapy the patient did not have any further attacks of gross hematuria, though the microscopic analysis occasionally showed red blood cells. His condition was regarded as hopeless at the time the diagnosis was established but, following irradiation, he lived approximately two years, during which time he was active and able to look after his business. A necropsy revealed that he died of general carcinomatosis, secondary to renal neoplasm.

The significant fact in the course of this patient's disease was that, prior to high voltage roentgen treatment, severe hematuria was a more or less constant feature. Following roentgen therapy there was a cessation of hematuria, although metastases were the cause of death.

From an analysis of the results of high voltage roentgen treatment in these two cases, my associate, Dr. Anders Peterson, proposed the use of high voltage roentgen treatment in certain protracted cases of idiopathic hematuria which are not amenable to local procedures. Our records reveal thirty-seven cases of essential hematuria. Of these, all but three responded to the customary instillations of solutions of silver nitrate, of variable concentrations, into the renal pelvis. One patient required nephrectomy because of persistent hematuria and a resultant secondary anemia. The other two patients were subjected to high voltage roentgen therapy:

CASE 3.—Mrs. H. J. F., aged 32, was seen, April 12, 1927, because of hematuria and pain in the right renal area, which were of two months' duration. There had been no urinary frequency. On general examination the patient was thin, but otherwise was fairly well looking. The systolic blood pressure was 90, the diastolic pressure 70. There were no abdominal masses or areas of tenderness. The cystoscopic examination showed hemorrhagic urine spurting from the right meatus; that coming from the left was clear. There was a small right ureterocele. Both ureters were catheterized without obstruction and a normal rate of drainage followed. A differential functional test with phenolsulphonphthalein showed an appearance of the dye in three minutes from both sides, with a 20 per cent return in fifteen minutes from each kidney. Roentgenograms of the areas of the kidneys, ureters and bladder were negative. Bilateral pyelograms showed the left kidney in the normal position, with the outline of the pelvis and calices normal. The right kidney was slightly dystopic and showed a moderate pyelectasis, although the calices were normal in outline.

A diagnosis of right essential hematuria was made, and on April 21 a 1 per cent silver nitrate solution was instilled into the right renal pelvis. This was repeated, May 3, a 2 per cent solution being used. Bleeding persisted and a 2 per cent solution was again instilled. This procedure was repeated, May 13, without effect. Nephrectomy was considered but, in view of the fact that high voltage roentgen exposure had been successful in checking the bleeding occurring with neoplasm, roentgen therapy was suggested as a possibility. This fact was made known to the patient, who expressed a desire to try it before an operation was undertaken.

May 20, 1927, high voltage roentgen exposure was given over the right kidney area, the technic being as follows: voltage, 220 kilovolts; distance, 40 cm.; filter 1 mm. of aluminum and 0.5 mm. of copper; current through tube, 4 milliamperes; area, 15 by 15 cm. field over the right kidney; total time of ninety minutes anterior and ninety minutes posterior—thirty minutes every other day, a total of six treatments. After the fourth treatment bleeding stopped and has not recurred to date, March 29, 1929, a period of approximately two years.

The present condition of the patient is very good. There is no clinical evidence of nephritis. The systolic blood pressure is 100 and the diastolic 80. The analysis of a voided specimen of urine showed a specific gravity of 1.018, no sugar, but a slight trace of albumin. The microscopic examination was negative for casts though a moderate number of leukocytes were present. The intravenous phenolsulphonphthalein return was 80 per cent in one hour and ten minutes.

CASE 4.—Mrs. M. G., aged 53, was examined, April 18, 1927, because of hematuria together with dull pain over the lumbar spine. Three weeks previously she had noticed bloody urine, which had persisted. No clots were seen. The pain over the lumbar spine was dull in character, without any particular radiation.

The general physicial examination was essentially negative. There was no weight loss; the blood pressure was 140 systolic and 90 diastolic; urinalysis revealed a slight trace of albumin, numerous red blood cells and a few leukocytes. A cystoscopic examination showed a normal bladder mucosa; definite hemorrhagic urine was spurting from the left meatus. A differential functional test with phenolsulphonphthalein showed a return of dye in three minutes from each side, with a concentration of 18 per cent from the right and 20 per cent from the left in fifteen minutes. A roentgenogram of the areas of the kidneys, ureters and bladder was negative. Bilateral pyelograms showed both kidneys in normal position with normal pelvis and calices. A diagnosis of essential hematuria was made and a 1 per cent solution of silver nitrate was instilled into the left renal pelvis. Twelve days later a 2 per cent solution of silver nitrate was instilled. The patient left the city for three months and, on her return, reported that she had not been free from bloody urine during her absence.

August 18, a 1 per cent solution of silver nitrate was again instilled into the left renal pelvis. Five days later a 2 per cent solution was used. Hematuria persisted and three days later a 5 per cent solution was instilled. This was repeated a week later without controlling the hematuria.

September 6, the patient was referred to Dr. Soiland for high voltage roentgen treatment. The technic and duration were identical with that used in case 3. The bleeding stopped after the first thirty minutes of exposure.

On request the patient came in for a check-up examination, April 12, 1929, approximately one and one-half years after roentgen therapy. The patient has been in good health and there has been no recurrence of hematuria. The blood pressure was 130 systolic and 80 diastolic. Urinalysis showed a specific gravity of 1,020, no sugar and no albumin. Microscopic examination was negative except for an occasional leukocyte. An intravenous phenolsulphonphthalein test showed 60 per cent return in one hour and ten minutes.

COMMENT

My experience with the results of roentgen therapy in dealing with intractable idiopathic hematuria suggests a field of usefulness for the procedure. Nevertheless, because of the susceptibility of the renal parenchyma to irradiation, I have been reluctant to advocate its use except in those cases which fail to respond to conservative measures. Sufficient experimental as well as clinical observations have accrued to substantiate the assertions that nephritis may be a sequela of intensive renal irradiation. Hartman's [2] elaborate studies on dogs are significant and his interest in the clinical application has resulted in the accumulation of eighteen cases of nephritis, developing during or after a course of high voltage roentgen therapy. Two of these cases were personally observed by him. He warns that children in particular are very susceptible. Similar experimental studies by Willis and Bachem [3] indicate that in the irradiated kidney tubular degeneration is primary and is followed by scar tissue formation, obliteration of the capillaries and finally glomerular atrophy. They attribute the contracted kidney thus produced to the

2. Hartman, F. W.; Bolliger, Adolph; and Doub, H. P.: Experimental Nephritis Produced by Irradiation, Am. J. M. Sc. **172**: 487 (Oct.) 1926; Functional Studies Throughout the Course of Roentgen-Ray Nephritis in Dogs, J. A. M. A. **88**: 139-144 (Jan. 15) 1927; The Cardiovascular Response in Experimental Nephritis, ibid. **89**: 1936-1940 (Dec. 3) 1927. Doub, H. P.; Bolliger, Adolph; and Hartman, F. W.: The Relative Sensitivity of the Kidney to Irradiation. Radiology **8**: 142 (Feb.) 1927.

3. Willis, D. A., and Bachem, A.: Effects of Roentgen Rays upon the Kidney, Am. J. Roentgenol. **18**: 334-337 (Oct.) 1927.

end-result of nephrosis. My favorable results and the possibility of postirradiation nephritis or nephrosis may seem confusing, and yet they need not be paradoxic. Proper evaluation must be based on standardization of dosage and technic. The principles of technic as used in my cases were developed by Dr. Soiland and his associates.[4] According to their interpretation the amount of irradiation instituted was well within the limits of safety, a dosage that has apparently fared well with the cases of idiopathic hematuria so treated.

CONCLUSIONS

1. Direct irradiation of the kidney is suggested as a means of treating idiopathic hematuria which fails to respond to conservative measures.

2. It may be a substitute for nephrectomy when radical treatment is contemplated.

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ABSTRACT OF DISCUSSION

DR. WILLIAM C. QUINBY, Boston: As regards the treatment of neoplasms by roentgen ray, so far as we know those tumors which are least differentiated are the most responsive to roentgen therapy. The clear-cut case which Dr. Hager has outlined to us of hypernephroma, which practically disappeared under high voltage roentgen treatment, is very interesting indeed, because one would not suppose *a priori* that this type of tumor would be amenable to this type of therapy. Nevertheless it was. Studies show that the effect of the roentgen treatment is brought about for the most part by causing sclerosis of the blood vessels. This is seen especially well in the instance of roentgen-ray burns of the skin. It is apparently by the process of atrophy following this sclerosis that the beneficial effects of roentgen rays on these tumors are brought about. Dr. Hager mentioned also that experimental exposure of the kidneys to the roentgen ray has been done, and that it is possible by this method to cause a definite, chronic nephritis. Therefore this method of treatment for chronic hematuria, as he well points out, may be a dangerous one in that sense. It is a two-edged sword. The roentgenologist must be exceedingly careful in regard to dosage or nephritis will be induced. Furthermore, we must remember the effect of the roentgen ray on the suprarenals; for there are cases on record in which the roentgen ray used carelessly has resulted in definite destruction of both suprarenals. In my opinion the diagnosis of idiopathic hematuria must be very carefully made before one is justified in running the risk of exposing a patient to severe high voltage roentgen therapy.

DR. O. N. MELAND, Los Angeles: As Dr. Hager pointed out, the effect of irradiation on malignant conditions of the kidney has been ineffectual so far as cure is concerned. The case he reports is evidently an exception to the rule. Irradiation is essentially a destructive force and for that reason must be used with caution; there is, however, apparently some degree of selectivity in different tissues. We know from experience that cells of reproduction, lymphoid cells, certain embryonal cells and endothelial cells of the capillaries are seemingly more sensitive than other contiguous structures. Experiments in which the kidney has been exposed surgically and in which irradiation is administered directly to the kidney need not be considered in the present discussion because such conditions do not obtain during life. On the other hand, the work carried out by Hartmann and Doub is exceedingly important, but we must remember that these experiments were carried out for the purpose of actually producing a nephritis in animals that would be comparable to the nephritis seen in man. The protocols show that the animals were exposed to enormous dosages—doses larger than we use in some malignant conditions. The problem is one of dosage. These patients received a 37 per cent depth dose in the region of the kidney which is, of course, entirely empiric, since we have no similar work to guide us. More experience may lead us to reduce it still further; it is a question that must be worked out later. Ordinarily it is not conceivable that the kidney function would be destroyed by such a dosage. For the past two years we have had under observation a patient who has had a lumbar sinus due to an old pyonephrosis. His surgeon decided to remove the involved kidney but he left a part of the upper pole which was buried in a mass of adhesions anchoring it to the diaphragm. Following the operation there was a daily drainage of 11 ounces of pus and urine. The patient was given two series of a 100 per cent depth dose over the kidney region for the purpose of destroying kidney function. It is now two years since the irradiation was given; the sinus still drains 3 ounces of fluid which has a decided odor of urine and a marked reaction for urea. This shows that destruction of the kidney by irradiation is not so easily accomplished. Therefore, we feel that patients with essential hematuria, in whom classic methods of treatment have failed, may be treated by irradiation with safety. If irradiation fails, nephrectomy can be done later with no added risk.

DR. E. L. KEYES, New York: As to survival following roentgen therapy, one patient was mentioned as having survived for two years. I once removed a kidney for so-called hypernephroma. The vein was full of tumor and I expected the patient to die promptly, but he lived and was well four years and then dropped dead of embolism. Since Fenwick described papillitis we have not gone far in understanding what "essential" hematuria is. I have been interested in the hematology back of it. Many patients have slight bleeding from the opposite kidney. One patient, though afebrile and a vigorous man, was found to have a streptococcus septicemia from the root of a tooth. Following removal of the tooth the blood cultures, which had been positive, became negative, the secondary anemia cleared up and the hemorrhage ceased. There has not been bleeding for three or four months.

DR. ROBERT E. CUMMING, Detroit: I was frankly surprised at Dr. Hager's use of the term "hypernephroma," for I thought this section had decided that it was not an acceptable term. It will be recalled that Dr. Keyes said so-called hypernephroma. We must remember that we know little about this type of tumor as regards its degree of malignancy; I recently saw a patient come to autopsy with a renal tumor weighing 65 pounds (29.5 Kg.) death being due to pressure and not malignancy, although the diagnosis of "hypernephroma" was made after study of the tumor by an eminent pathologist. I, too, have seen instances in which renal bleeding has ceased as the result of high voltage roentgen therapy, with cessation of pain, although the latter may be due to the hemorrhage and not the tumor. I am much interested in this method of treatment for idiopathic hematuria, and feel that we cannot classify as such the case mentioned by Dr. Keyes, in which the bleeding was due to a known infection. I think adenocarcinoma is the most acceptable term, but it does not describe the type of tumor which kills by pressure and is not malignant; it suggests the smaller deadly malignant type.

DR. B. H. HAGER, Los Angeles: I appreciate the attitude Dr. Cumming takes, and think that perhaps adenocarcinoma, with differentiation of the type of the tumor, might better be used than the term "hypernephroma."

4. Soiland, Albert; Costolow, W. E., and Meland, O. N.: Radiation Treatment of Certain Kidney Disorders, California & West. Med. **30**: 93 no. 2 (Feb.) 1929.

Faces and Disease. — Gallbladder and pernicious anemia people have wide faces and wide upper faces. Pernicious anemia people have wider lower faces than do the gallbladder, as shown by the relatively large bigonial diameter for both male and female. They also have much wider eye zones than the gallbladder people, as demonstrated by the interpupillary-nasion prosthion index. Nephritis-hypertension people and tuberculosis individuals, on the other hand, have relatively narrow faces. The nephritis-hypertension group has comparatively broad eye zones in contrast with the tuberculosis type, which has very narrow ones. Ulcer people are intermediate in all respects. The cumulative percentage distribution curves check with the results based on the arithmetic averages. When the interpupillary space is expressed in per cent of the facial width, the nephritis hypertension of both sexes appear to be particularly wide-eyed because of their narrow faces.—Draper, George: Disease and the Man, New York, Macmillan Company, 1930, p. 73.

THE CONTROL OF IMMEDIATE SHOCK FOLLOWING HYPODERMIC MEDICATION

PRELIMINARY REPORT

STANLEY W. INSLEY, M.D.
DETROIT

The thought of a possible constitutional reaction is always in the background for those who may be administering any large series of immunizing injections. This possibility occasionally becomes a reality, and when the reality does appear it is often a matter of grave consequence, leading even to death.

One and a half years ago an unlooked for incident occurred in my office which started me off on a train of investigation designed to remove immediate shock as a complication of immunizing therapy. The history in brief is as follows:

CASE 1.—Mrs. J. M., aged 53, suffered from severe hay-fever and asthma due to the grasses and ragweeds. The condition started June 1 and lasted until about September 20. Four injections of a commercial timothy extract had already been given in two days by a short interval method. An injection of 0.048 mg. (16 units) was to be given at noon. Because of a mistake in the dilution, 4.8 mg. (1,600 units) was injected. The error was immediately noted on check up of the bottle following treatment. At nearly the same moment the patient noticed itching. A tight tourniquet was applied just proximal to the injection area, preparatory to the finding of a knife for incision. I intended to release as much of the antigen as possible by free and open drainage. One cubic centimeter of epinephrine was injected above the tourniquet and ¼ grain (48 mg.) of ephedrine was administered orally.

Three or four minutes later a knife was available. However, the patient by this time was showing no added signs of pollen reaction, and incision was delayed. The rubber tourniquet, because of its being drawn very tight, was making the arm painful. A blood pressure cuff was substituted and the pressure brought to 140 mm. of mercury, systolic pressure for this patient. From three to four minutes more passed and the whole arm was again becoming uncomfortable from constriction. The pressure was dropped to 90 mm. Nothing unusual occurred after another five minutes. It was now becoming apparent to me that if I could maintain a very slow absorption of the injected material I might get by without further serious trouble, an old idea, of course, in experimental work done in anaphylaxis on animals.

The blood pressure cuff was entirely released one hour later, the drop from 90 mm. of pressure being made gradually. Another half hour passed and the patient still showed no signs of reaction. Three-fourths grain of ephedrine was again administered. Two hours from the time of the original injection the patient was sent home and asked to report back that evening. She was further instructed that if she showed the slightest signs of itching or cough, a rubber tourniquet was to be reapplied, ephedrine was to be taken and I was to be notified immediately. At 7.30 p. m. the patient reported back. There had been no disturbance other than a feeling of weakness, tremor, and a rapid pounding of the heart, the result, I think, of the total amount of ephedrine and epinephrine taken. There was no unusual appearance to the arm, except a moderate boggy swelling extending to just below the elbow, a slight redness and no pain. A scratch test was made with timothy. The reaction had dropped from four plus to a doubtful one plus. No further grass pollen was given, and as events proved later, a clinical tolerance had been developed which persisted during the grass season.[1]

1. Cooke, R. A.: Studies in Specific Hypersensitiveness: The Dangers of the Diagnostic Cutaneous Test and Therapeutic Injections of Allergens, J. Immunol. **7**: 119 (March) 1922. I was unaware of Cooke's earlier suggestion as to the use of a tourniquet at the time of the experience described here. Credit is due him for first utilizing a pressure arrangement.

Such an experience naturally led to a further checking up of circumstantial conditions. For the rest of the summer and the fall of 1928 it became a routine procedure in my office to adjust a blood pressure cuff immediately and apply pressure the moment any patient showed signs of general reaction. It became increasingly evident that less reliance need be placed on the balancing of shock by the use of epinephrine and like preparations. With a proper slowing of the rate of absorption, the body seemed to adapt itself remarkably well. Toward the end of the season, epinephrine was being used only to clear up severe trouble that had already started before the pressure arrangement became effective.

Further proof of the value of such applied pressure in the control of symptoms from hypodermic injections became evident in other ways. Case 2 illustrates this point:

CASE 2.—Mrs. A. K., aged 36, a sufferer from hay-fever and asthma, gave a four plus reaction to ragweed, exhibited an exophthalmos, and gave the impression of a very unstable vasomotor system. There had been considerable trouble with desensitization in that increased doses were not well borne. Finally with the tenth injection the patient developed a severe reaction before a cuff could be applied. Epinephrine was thought advisable to clear up the already marked symptoms. Three minims (0.2 cc.) was given. There was an immediate development of severe epinephrine symptoms; the patient, already frightened, now became hysterical. A cuff was also placed around the other arm above the site where epinephrine had been injected. In from forty to fifty seconds the marked tremor and body jerking commenced to quiet down and in three minutes she was quite comfortable. The next forty-five minutes was spent in alternatingly loosening first one cuff and then the other. The patient was sent home ninety minutes following the original ragweed injection.

This curtailment of the effect of epinephrine by the use of pressure proximal to the injection site was frequently corroborated. The repeated good results in combating trouble led me into an attempt to gage more accurately first the practical amount of pressure required to slow up absorption satisfactorily, and, secondly, the length of time following such application of pressure that symptomatic changes might be expected.

Experience during a year and a half with this use of a blood pressure cuff, combined with a total number of what now amounts to more than 3,300 immunizing injections, has led me to believe that the pressure need not necessarily be sufficient to cut off the arterial flow. It should be sufficient to cut off not only venous return but also lymphatic seepage. The routine order of applying pressure of from 100 to 120 mm. of mercury is now working out satisfactorily. After two minutes this is lowered to 80 mm. It is dropped to 60 mm. four minutes later. The pressure may be maintained, lowered or raised from this figure in comformity with the patient's reactions. The continued partial blocking at this pressure seems sufficient for the average individual given an injection in the arm. The total length of time that any pressure need be maintained is rarely more than sixty minutes. The average total time for compression has been thirty minutes.

An attempt was next made to determine the length of time necessary for the therapeutic benefit of such pressure to manifest itself. The average time for a change of symptoms, with pollen, animal emanation, orris root and epinephrine, varied between thirty and sixty seconds. The total clearance of systemic symptoms varies much more widely, of course, depending in

general on a variety of factors not necessarily related to the primary cause and onset of relief.

A short time ago, Dr. Gordon of the Herman Kiefer Hospital, Detroit, kindly consented to check the value of this pressure control so far as it might be applied to serum reactions. The contagious disease division of this hospital is one of the largest in America and Dr. Gordon is in an excellent position to judge not only the severity of immunizing serum reactions, which are seen in goodly numbers, but also the efficiency of any procedure tending to control them. The method has been used in four severe immediate reactions with what he thinks have been beneficial results. In at least one case he feels strongly that it was a true life-saving procedure. The usual method in this hospital is to inject serums (antidiptheritic, antiscarlatinal, and the like) into the outer lower thigh; this being done of course, only in the absence of marked contraindications to the use of undiluted horse serum. Pressure is immediately applied around the upper part of the thigh in all cases which show any immediate serum reaction. The usual procedures for controlling shock are then instituted. Dr. Gordon feels as well as I that there is a large field for such a controlled technic because of the tremendous amount of serum that is being used today by all. I believe that his experiences will be recorded later.

Dr. W. W. Duke [2] of Kansas City, after a personal interview last summer, also kindly offered to test out this idea of controlling the absorption of pollen in his treatment of hay-fever. He has found that the routine application of pressure proximal to the area of injection is of considerable value in preventing and controlling immediate reactions.

I am now using a blood pressure cuff for the control of absorption in all pollen, animal emanation, specific protein, and serum inoculations.

The cumulative evidence pointing to a highly efficient way of controlling antigen injection has led me into an attempt to utilize further the phenomena for the more rapid immunization of allergic patients. The past pollen season found me using a short interval preseasonal subcutaneous method, and a coseasonal intradermal method. In both instances it was made a rule that first of all a blood pressure cuff should be applied proximal to the site of every injection. It was further directed with the preseasonal method that all injections be made barely subcutaneously. This is done to keep the solution where it may be observed to better advantage and to make it more amenable to outside manipulation. Avoidance of veins was to be checked by repeated withdrawals of the piston. Immediately following all injections, preseasonal and coseasonal, the cuff was pumped up to a pressure of from 100 to 120 mm. of mercury, depending on the size of the arm. A large arm apparently requires more pressure in a cuff to retard lymphatic and venous absorption efficiently. The cuff was gradually deflated and finally released to zero only when it was felt that no general reactions would be likely to appear. As a matter of experience it has been noted that if such a condition was imminent, it would manifest itself somewhere in the scale of declining pressure. For example, if in a drop of from 90 to 60 mm. of pressure some premonitory signs of itching or cough appear, the cuff is immediately pumped up again to the original pressure, held there from three to five minutes longer, and then more gradually released. The entire procedure, from the application of the cuff and the giving of an injection to the removal of the cuff, lasted from fifteen to forty-five minutes in a majority of cases. Several injections were kept under control with pressure for more than an hour. The variations depend on the individual's response to the particular injection and can be gaged, as mentioned before, by their behavior to a slackening of pressure. Some patients, as all workers will agree, are very unstable and must be closely watched. Others seem to withstand increases of dosage very well, and in these the retardation of absorption did seem at times quite unnecessary unless huge doses were planned.

I shall not go into detail or present arguments as to the identity of human allergy with animal anaphylaxis. I think that in either case it may be presumed that, relatively speaking, reactions are actually more dependent on the rate of contact between tissue and specific protein or atopen than on the total amount of offending substances offered. Many times a lethal dose of such a specific substance may be quite harmlessly absorbed, provided it is diluted enough or administered slowly enough. The converse certainly is observed frequently in practice; namely, that a harmless subcutaneous dosage becomes highly fraught with danger if intravenously injected. I feel that the average necessary time for treatment may be shortened with the suggested method for controlling absorption.

I still insist that drugs must have some place in immunizing therapy even with such a control. All of our patients treated with pollen are instructed to carry ephedrine with them. It is explained that if an occasional delayed reaction should occur they are immediately to reapply some sort of first aid tourniquet, take their dosage of ephedrine, and telephone the office for further directions. Patients suspected of later reactions were given ephedrine orally before leaving the office. Epinephrine also must be used at times. Its principal use, however, has gradually dwindled to the correction of a reaction which may have been induced before the pressure control became effective.

One hundred and forty-two cases of pollen sensitivity, hay-fever and asthma were treated in July, August and September of this year. Both preseasonal and coseasonal methods were used. Six patients given pollen injections later required epinephrine in the office: two of these six required two doses of epinephrine. Four patients suffered enough delayed reaction to cause them to telephone in. Two of the four had required epinephrine in the office, one of the two requiring two doses. Nearly all were receiving desensitization injections of solutions of 2 per cent or 3 per cent concentration. Three of the six patients requiring epinephrine showed considerable leakage of blood through the needle opening in the skin after the application of pressure. I feel that at least part of the trouble in these cases was due to an unrevealed blood vessel injury. I have deduced that removal of the needle from the tissue allowed some back seepage of material through a venous laceration, so as to approximate a small intravenous inoculation. In none of these cases had the cuff been pumped up until a few moments after injection. It has been one of my surprises to note the frequency with which blood may appear externally through these skin punctures following venous retardation. Apparently, nearly any careful injection may lacerate some vessel in a large or small way.

2. Duke, W. W.: New Method of Administering Pollen Extract for Purpose of Preventing Reactions, this issue, p. 767.

Two cases of shock were seen in consultation outside this series, both within a few doors of where I happened to be present. Both occurred nearly instantaneously following inoculation. The patients had already been given epinephrine with no signs of recovery. I applied a blood pressure cuff proximal to the site of injection and ran the pressure up to 120 mm. In each instance a steady stream of venous blood started trickling through the needle puncture in the skin. The physicians, both careful men, insisted that no blood had shown in the syringe and pointed to the fact that the injection had raised a lump just under the skin. Each patient started improving promptly following the application of pressure. The body seems to have wonderful powers to recuperate, provided adaptation is allowed to proceed faster than additive insult.

CONCLUSIONS

1. The rate of absorption for subcutaneous injections of medicaments can be accurately controlled.
2. The regulation of absorption has a large and definite value in the prevention and control of allergic shock. Apparently it is a desirable addition to any routine technic of desensitization or serum inoculation.
3. There may be merit in the application of the procedure outlined to a scheme of more rapid desensitization.
4. It is hoped that the interest of a larger group of workers in allergy may be stimulated so that the method may be evaluated more completely.

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NEW METHOD OF ADMINISTERING POLLEN EXTRACT FOR PURPOSE OF PREVENTING REACTIONS

A SUBCUTICULAR METHOD

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Constitutional reactions, which rather frequently follow the administration of pollen extract, may be severe and even dangerous unless immediately controlled by experienced physicians. They occur with every method of pollen therapy with which I am acquainted. They can be reduced in likelihood of occurrence and in severity by careful adjustment of dosage and the time interval between injections and by avoidance of physical effort and exposure to heat after injections. However, in spite of all care, reactions rather frequently occur which may be so severe that many physicians and many patients have been induced to condemn pollen therapy as unjustifiable for the average patient with pollen hay-fever or asthma. Following several severe and apparently unavoidable reactions last year, I was tempted to discontinue pollen therapy unless I could devise a method which could be considered almost reaction proof.

In this paper I shall describe a method which reduces the likelihood of reaction to an almost negligible factor if carried out in strict detail.

POLLEN REACTIONS

Even if pollen injections are given in ideal dosage and under ideal conditions and after time intervals which are adapted to the patient, reactions of gross severity may nevertheless occur. These are due, I am sure, to a too rapid rate of dissemination of pollen from the site of inoculation to the body tissues generally. The method of administering pollen described here is designed to control the rate of dissemination from the site of inoculation and depends on four important steps:

1. The placing of a rubber tourniquet around the arm above and just prior to the injection of the pollen, and its frequent removal and replacement for at least five minutes after the injection.
2. The admixing of epinephrine and ephedrine with the pollen solution in such dosage as to slow down its rate of dissemination from the site of injection.
3. The reducing of all doses to a given volume by an admixture of physiologic solution of sodium chloride.
4. The introduction of 0.01 cc. of the pollen mixture subcuticularly, preliminary to the injection of the entire mixture. The appearance of a tiny blanched area will indicate that the needle is not in a vein and the entire mixture, if injected, will go into the subcutaneous tissues.

I can state from experience that none of these steps in technic can be neglected without danger of constitutional reaction.

Through the use of tourniquets prior to pollen inoculations (as will be described) with observation of the patient, one is immediately impressed with the fact that the effect of both pollen and epinephrine in the general circulation is not only immediate but transitory in high degree. A pollen reaction can be stopped under certain ideal circumstances within thirty seconds or one minute by stopping its dissemination from the site of inoculation to the general circulation by a tourniquet applied above the injection. A histamine reaction, caused by a local injection, can be stopped as promptly if the tourniquet is applied at the first symptom of flushing of the chest or face. Also an epinephrine reaction, caused by a hypodermic, can be stopped as promptly if the tourniquet is applied at the first sign of tremor or feeling of weakness, pounding of the heart or nervous tremor.

The effect of pollen, histamine and epinephrine in the circulation is immediate and very transitory. A prolonged pollen reaction or prolonged histamine reaction or prolonged epinephrine reaction (that is, reactions lasting fifteen minutes or more) is due to prolonged distribution of these agents from the site of the inoculation rather than to a prolonged effect of a given quantity in the general circulation at a given moment. These facts will be so apparent to those who wish to repeat these observations that I need not give the detailed data on which these statements are founded.

USE OF THE TOURNIQUET

The use of a rubber tourniquet in the treatment of pollen reactions, as introduced by Cooke and elaborated more recently by Insley [1] is a most useful method of shortening pollen reactions. The tourniquet need not be applied tightly enough to cut off arterial flow but should be applied tightly enough to cut off venous return. Relief often begins within one minute. The use of a tourniquet makes inadvisable the injection of epinephrine in unlimited quantities in the opposite arm, since under these circumstances an epinephrine effect may be so marked as to give the patient pallor, tremor, pounding of the heart and cardiac arrhythmia, which may be as upsetting as a pollen reaction. Insley has correctly demonstrated the fact that an epinephrine effect can be promptly stopped by a tourniquet if applied above the site of inoculation of the epinephrine. I

1. Insley, S. W.: The Control of Immediate Shock Following Hypodermic Medication, this issue, p. 765.

cannot overemphasize the importance of these observations. The appropriate use of tourniquets places epinephrine and pollen reactions under the control of the physician.

AVOIDANCE OF REACTIONS

The foregoing statements apply to the treatment of reactions. The following apply to the prevention of reactions. For this purpose, a tourniquet should be applied around the arm prior to the inoculation of pollen. This is highly advisable because of the fact that pollen is occasionally injected into a small venule or lymphatic channel and gives rise to an immediate reaction (within seconds) which may be severe in spite of the fact that epinephrine and ephedrine may have been mixed with the solution. Several such reactions which occurred immediately after the introduction of pollen mixed with epinephrine and ephedrine according to the technic to be described induced me never to inject pollen again without the previous application of a tourniquet. When a pollen-epinephrine mixture is used, immediate reactions which follow an inoculation without the use of a tourniquet are inclined to show the epinephrine effect first (pallor, tremor, heart pound and arrhythmia). This is followed, as a rule, after a very short time by a pollen effect (allergic coryza, cough, itching). Both effects can be stopped, as a rule, within one minute or a little more by a tourniquet. The administration of epinephrine in the opposite arm is often unnecessary if the tourniquet is applied promptly enough, or if it is applied prior to the introduction of pollen. Since an epinephrine effect which can be noted by the patient as a feeling of tremor is usually noticed prior to a pollen effect, the physician by questioning the patient can usually apply the tourniquet before a pollen effect starts and thus completely prevent a pollen reaction.

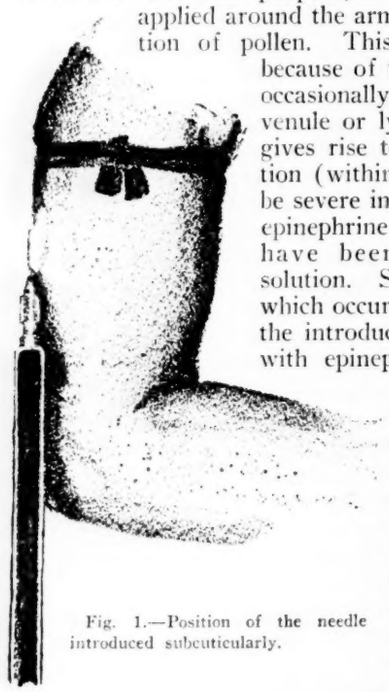

Fig. 1.—Position of the needle introduced subcuticularly.

In one case, a reaction produced by a pollen-epinephrine mixture without the preliminary use of a tourniquet resulted in coryza, cough and slight asthma within a very few seconds of the time of inoculation, which condition was followed by a convulsion, coma, complete disappearance of pulse and respiration, and cyanosis. The patient commenced to recover within one or two minutes after the application of a tourniquet, the administration of epinephrine in the opposite arm, and an ice rub to the chest, back and arms.

If a pollen-epinephrine mixture is injected, the epinephrine effect as just mentioned usually precedes the pollen effect. If the absorption is too rapid, the patient may have pallor, heart pound and arrhythmia in spite of the fact that the amount of epinephrine used is very small indeed. These immediate reactions are due, I feel sure, to the introduction of a portion of the pollen mixture into a venule or lymphatic channel. This is proved by an observation that was made.

In a patient in whom the needle had been introduced subcuticularly, for the administration of pollen, without the tourniquet, the piston of the syringe was withdrawn strongly. No blood appeared in the syringe, so 0.01 cc. of a pollen-epinephrine mixture was injected. The characteristic white skin area, to be described, which should follow such an injection given subcuticularly did not appear. The piston of the syringe was withdrawn again, this time with the appearance of blood in the syringe. The syringe was withdrawn. The patient almost immediately showed pallor and tremor. This was followed by coryza and itching. He was given 0.25 cc. of epinephrine divided into three areas in the opposite arm. The reaction disappeared within a minute or so. The dose which caused the pollen reaction in this patient was one-twentieth the size of a dose which he had tolerated without visible ill effect three days prior to this time, and must, necessarily, have been caused by an intravenous inoculation.

RELEASE OF THE TOURNIQUET

After a pollen-epinephrine-ephedrine mixture has been given, according to the technic to be described, the tourniquet should be released for a few seconds and reapplied. If nothing happens, it can be released again and reapplied. Release and reapplication can be continued at thirty second intervals, with gradual lengthening of the time intervals for about five or ten minutes. If a patient goes for this length of time with no evidence of a pollen or epinephrine reaction, the tourniquet can be permanently released with apparent safety. In spite of this apparent surety, however, the physician should keep the patient in the office for from one-half to one hour as a matter of precaution.

If on release of the tourniquet at any time the patient begins to experience symptoms of epinephrine or pollen reaction, the tourniquet must be reapplied around the arm immediately.

If the symptoms of pollen reaction are at all severe, which is practically never the case, epinephrine may be administered in the opposite arm. However, if judgment is used in the release and reapplication of the tourniquet, symptoms should never appear which require epinephrine. If epinephrine should be required, it should be given in guarded doses in the opposite arm, for a large dose applied carelessly may give rise to a very pronounced epinephrine effect which is undesirable and which disturbs the patient greatly.

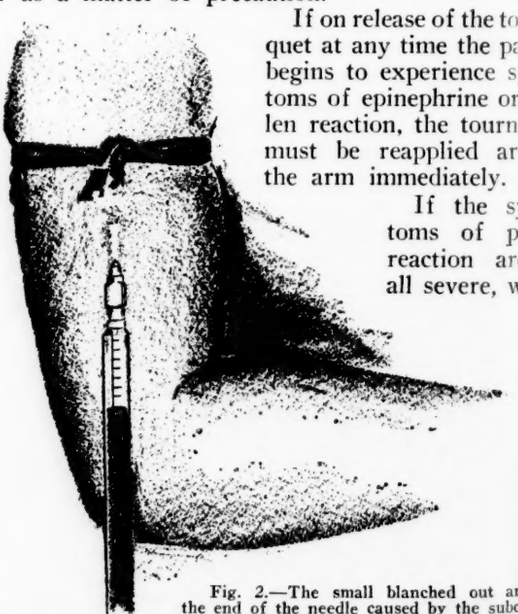

Fig. 2.—The small blanched out area at the end of the needle caused by the subcuticular injection of 0.01 cc. of a pollen-epinephrine-ephedrine mixture. The blanched out area indicates that the solution has been introduced subcuticularly and not into a small vein or lymphatic vessel.

Success in the use of this method depends on good judgment as to the time at which to release and to reapply the tourniquet, and I can state with assurance that, through timely release and reapplication of the tourniquet, reactions which appear will be only slight and transitory. It is this which convinces me that the effect of epinephrine and pollen as well is not only immediate but also transitory and that a prolonged pollen or epinephrine effect is due to continued dissemination from the site of inoculation and not to a long continued effect of any given amount of either pollen or epinephrine in the circulation itself.

THE ADMIXING OF POLLEN WITH EPINEPHRINE AND EPHEDRINE

Epinephrine mixed with pollen extract serves to slow down the rate of dissemination of pollen from the site of inoculation. This fact, though not mentioned in the literature, is well known and has been used by Koessler, Thomas and Balyeat. A pollen-epinephrine mixture allows reactions to appear within half an hour or so of the time of inoculation. In other words, it does not hold the pollen local long enough. To prolong the epinephrine effect, ephedrine must be added to the mixture. Since epinephrine mixed with pollen solution rapidly loses its potency, the mixing of epinephrine with pollen extract must be made at the time of inoculation. Ephedrine and epinephrine are compatible and stable. A solution of two parts of ephedrine (3 per cent) with one part of epinephrine (1 : 1,000 solution) is a good mixture to add to pollen extract. If the pollen extract in concentrated solution is drawn up into a syringe and to this is added 0.15 cc. of an ephedrine-epinephrine mixture and enough physiologic solution of sodium chloride to make a total volume of 0.45 cc. or a little more, the mixture, if injected subcuticularly, can by the use of a tourniquet be held at the site of injection so long that reactions can be reduced almost to the point of disappearance. The only reactions I have observed after this mixture was used in combination with a tourniquet and the subcuticular method of injection were reactions of minor importance which appeared several hours after the inoculation had been given. These reactions were apparently brought on by undue exposure to heat or by physical effort. Patients should be warned against effort and exposure to heat for several hours after pollen injections, since both heat and effort have a distinct tendency to stir up reactions.

If a quantity of epinephrine greater than that advised (namely, a total quantity of 0.05 cc.) is used, the patient rather frequently experiences pounding of the heart and cardiac arrhythmia. A larger quantity of epinephrine than this is not needed and seems inadvisable. The quantity of ephedrine seems adequate. Possibly the addition of more would do no harm, but it seems unnecessary.

CONSTANT TOTAL VOLUME FOR POLLEN MIXTURE

The use of a constant total volume for pollen mixtures seems advisable. Pollen solutions as frequently used are made up in serial dilutions, each of which is ten times the strength of the next weaker. Consequently, when the top dose of a weaker solution is used, the next step may be the giving of one-tenth the volume or more of the next stronger dilution. Thus the patient may get both an increase in the total dose of pollen and a tenfold increase in the strength of pollen solution. This can be avoided if each dose of pollen extract is measured out into the syringe and to this is added enough epinephrine-ephedrine solution and saline solution to bring the total mixture up to a constant total volume. If pollen is used in this way, it cannot be drawn up into the syringe and measured according to the scale in the usual manner, since about 0.03 cc. or more of pollen extract is contained in the lower end of the syringe which is not registered on the syringe scale. When other solutions are drawn into the syringe, it naturally brings this 0.03 cc. into the syringe, thereby introducing a source of error. The pollen extract must be drawn up into the syringe and after this a bubble of air must be allowed to enter the syringe, so that the amount of pollen in the syringe can be measured directly on the scale.

SUBCUTICULAR INJECTION OF POLLEN EXTRACT

I have discarded the intracutaneous method of injection of pollen for the subcuticular for two good reasons. The intracutaneous injection of pollen gives rise to too many scars. Furthermore, the concentration of the solution which must be used is such that reactions are more frequent than with subcutaneous methods. Then, too, skin tissue is more resistant to injections than subcutaneous tissues and gives rise, I am sure, to a more rapid dissemination of extract and to reactions more frequently on this account than do subcutaneous methods.

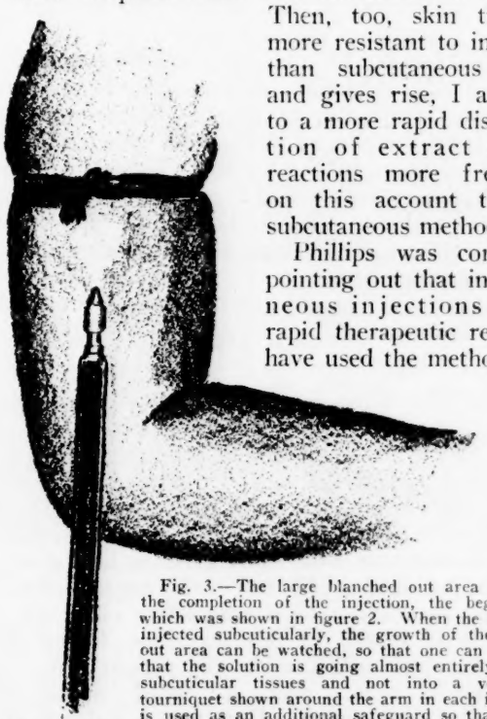

Fig. 3.—The large blanched out area caused by the completion of the injection, the beginning of which was shown in figure 2. When the solution is injected subcuticularly, the growth of the blanched out area can be watched, so that one can be certain that the solution is going almost entirely into the subcuticular tissues and not into a vein. The tourniquet shown around the arm in each illustration is used as an additional safeguard so that, in case any of the solution should be introduced intravenously, its sudden entry into the general circulation can be stopped by the arm band. After the injection is complete, the arm band can be released for a second or two and reapplied, so that, in case dissemination of pollen solution from the site of inoculation is too rapid, it can still be held local in the arm by the band and allowed to enter the general circulation in small doses. Through frequent release and reapplication of the arm band, dissemination of pollen solution from the arm can be controlled absolutely, so that even light reactions caused by pollen can be reduced practically to a point of disappearance.

Phillips was correct in pointing out that intracutaneous injections give a rapid therapeutic result. I have used the method three years with the best therapeutic results I have obtained by any method but have discarded it on account of its tendency to cause reactions.

If pollen extract is injected subcuticularly (just beneath the skin) instead of intracutaneously, many of the advantages that characterize the intracutaneous method can be obtained and its disadvantages avoided. First and most important, injections close to the surface can be observed easily because they are superficial and if need be can be isolated easily from the body by injections of epinephrine around and under the site. This is difficult to do if the injection is deep.

If the needle is injected just through the skin and then introduced farther parallel to the skin, so that the

point of the needle remains just beneath the skin, the introduction of 0.01 cc. of an epinephrine-ephedrine-pollen mixture gives rise almost immediately to a small blanched out area 1 or 2 mm. in diameter. This indicates that the pollen extract has been introduced into the subcuticular tissues and not into a venule or lymphatic channel. (For proof of this, I may refer to the case cited previously.) After the appearance of the blanched out area, the remainder of the extract can be injected. The increase in the size of the blanched area with continuance of the injection can be watched closely so that one can be almost certain that the solution is going into tissues and not into a vein. It was mentioned before that the introduction of 0.01 cc. of the epinephrine-pollen solution into a vein or lymphatic channel does not give rise to the blanched area described, so in case the blanched area does not appear the syringe must be removed and reinserted.

Even with all this care in the giving of epinephrine-ephedrine-pollen solution subcuticularly, an immediate reaction (occurring within seconds) or a usual pollen reaction (occurring within minutes) can occur if the tourniquet has not been placed around the arm prior to the time of inoculation, and is due, I am sure, as previously mentioned, to a rate of dissemination of pollen from the site of inoculation which is too rapid for the tolerance of the patient. These two types of reaction, the immediate and the usual, can be absolutely prevented and controlled by the timely application and release of the tourniquet as previously described. All that remains to bother us, therefore, are delayed reactions which may occur in rare instances several hours after the inoculation.

REACTIONS FROM METHOD

Constitutional reactions which follow this method of administration are almost nil and are of minor importance. In fact, over a period of about six weeks, during the busiest part of the year, I did not have one single severe reaction and not more than three or four mild ones, in spite of the fact that from fifty to seventy-five pollen inoculations a day were given in bold dosage.

In the beginning of the use of this method of therapy, I feared the chance of a cumulative effect of pollen extract held locally in this way, and feared delayed reactions which might affect the patient after leaving the office at a time when he could not be reached quickly by a physician. However, I did not observe evidence of cumulative effects from this use of pollen, and delayed reactions, instead of being more frequent, were much less frequent and less severe than when injections were given without the mixture of ephedrine and epinephrine.

Local reactions which follow the use of this method are almost nil. Within a few moments of the time of inoculation, a blanched out area appears around the site of inoculation which may be 1 or 2 cm. in diameter, associated with a slight swelling of the tissues. This, as a rule, disappears after one or several hours and is followed by nothing of importance. The huge areas of edema and itching which are so frequently observed after the use of pollen solutions alone are never observed after the use of a pollen-epinephrine-ephedrine mixture. This may or may not be an advantage. It is an advantage so far as the feelings of the patient are concerned. It robs the physician, however, of an important little guide which he might use in determining the optimal time interval between injections.

EFFECT OF HEAT, EFFORT AND COLD

I have observed repeatedly for many years that heat and effort, especially a combination of the two, tend to bring on and to augment constitutional reactions. For this reason, my patients have been for many years urged to avoid undue exposure to heat and physical and mental effort for a number of hours after receiving pollen injections. Furthermore, in case of reaction, patients in the office were immediately rubbed with ice. Those who were away from the office were advised to get into cold water as quickly as possible. Ice, if applied over the arms, chest and back, especially if applied rapidly over a large skin area, stands second only to epinephrine in the relief of pollen reactions. Ice should be kept on hand ready for immediate applications by physicians who administer pollen therapy. The results of Cannon, Querido, Britton and Bright showing that cold actually causes an epinephrine effect on the heart rate may account in part at least for the fact that an ice rub is a useful therapeutic agent for the control of a pollen reaction. My results would tend to confirm a theory that cold increases the secretion of epinephrine.

UNDUE EXPOSURE TO POLLEN

Undue exposure to pollen should be avoided after a pollen inoculation. Patients after leaving the office should not take trips in the country if the pollen content of the air is high. On the contrary, they should remain indoors if possible. Undue exposure to pollen can cause asthma or coryza because of the combination of pollen inhaled and pollen received by injection. This applies, of course, to treatment during the pollen season.

DETAILS OF TREATMENT

The time interval, final dosage and results of treatment have been discussed by many observers and need not be taken up in detail here except to say that pollen can be given safely at intervals of one, two or three days or at intervals of one week. Authors differ with regard to the optimal time interval. Optimal time intervals seem to me to vary with the patient and with the situation of the patient. If patients live out of town and there is need for haste, a short interval method certainly simplifies matters. If a patient has delayed reactions, short interval methods cannot be used. The gross majority of patients can easily tolerate a one, two or three day interval. A few cannot, so that a long interval method must be used. When epinephrine and ephedrine are added to pollen solutions I am not sure but that a time interval of at least two days or more should be chosen until we are better acquainted with the method.

The degree to which the pollen has to be pushed in order to obtain a good therapeutic result varies in different patients and in different districts. In this district, less than 0.5 cc. of a 5 per cent extract must be considered inadequate treatment, although some patients are relieved by much less than this. I have the impression that dosage will have to be pushed definitely higher if epinephrine and ephedrine are mixed with the extract. The therapeutic results obtained in 1929 with a pollen-epinephrine-ephedrine mixture were about the same as those obtained in previous years with pollen alone, but the pollen content of the air was unusually low as compared with previous years. Our highest count in 1929 was only 1,000, as compared with the 2,500 of average years and the 4,500 of one year. Consequently, I do not know that the immunity produced in 1929 by 0.5 cc. of a 5 per cent extract was sufficient for an average season.

Even with one year's experience with more than a hundred patients treated as outlined, however, I can say that pollen reactions can be avoided; that they do not benefit the patient to any great extent if at all, and that a considerable degree of tolerance can be gained by the giving of a pollen-epinephrine-ephedrine mixture.

SUMMARY AND CONCLUSIONS

Reactions from pollen therapy can be reduced to an almost negligible factor through control of dissemination of the pollen from the site of inoculation by the use of tourniquets above the site of inoculation, the admixture of epinephrine and ephedrine with pollen solutions, the use of a given standard of volume for solutions injected, and the avoidance of intravenous injections through the use of the subcuticular method as described.

Pollen reactions are not necessary to success in treatment, do not seem to be useful to either the patient or the physician, and should and can be avoided.

A good degree of tolerance can be obtained by the method described here, and the results of therapy compare fairly well with methods used previously.

Federal Reserve Bank Building.

URETERAL KINKS

HOW THEY OCCUR AT THE ORDER "TAKE A DEEP BREATH AND HOLD IT" *

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Each year, in the urologic section of the Mayo Clinic, more patients are seen than in the year before who state that they have been informed that a kink in one of their ureters is responsible for their rather indefinite symptoms and that its surgical correction is urgent. On general examination, evidence of renal ptosis is not demonstrable and pyelograms fail to show the kink previously pointed out to the patient.

This discrepancy has occurred so often that we recently reviewed our old pyelograms in order to ascertain the frequency of ureteral kinks. We were astonished to find how frequently a kink would be present in one roentgenogram but absent in a subsequent exposure, although the identical portion of the ureter might have been exposed but a few minutes later.

The literature contains several articles calling attention to the part that a ureteral kink may play in the production of hydronephrosis. Barney [1] showed pictures of such a kink that was completely relieved by nephropexy, and Sisk [2] stated: "On careful examination these kinks often will be found to be the cause of severe attacks of pain which have occurred over long periods of time and which never have been explained. . . . The pain resulting from a kinked or tortuous ureter is undoubtedly due to the retention of urine above the kink." Although these authors have emphasized the pathologic and detrimental aspects of kinks of the ureter, we cannot find any who has called attention to the complete freedom from symptoms found in many cases. We would therefore emphasize that the mere finding of a kink in the ureter does not explain necessarily the indefinite pain that the patient has had over a long period of time, and urge that before surgical measures are employed for the correction of the kink a more careful relationship between it and the pain be established. A kink of the ureter sufficient to cause symptoms should result in retention and delayed emptying above the kink and, if long continued, deformity of the renal calices and pelvis. This can be ascertained readily by making pyelograms at intervals of five or ten minutes, and it would seem that unless stasis of urine can be so demonstrated there is little reason to believe that the kink in the ureter is producing symptoms.

Crosbie,[3] in 1923, writing on this subject, said:

> We must recognize that the kidney and ureter are held in their respective positions by two entirely different groups of supports. . . . The ureter is supported by being fixed closely to the posterior surface of the peritoneum. This attachment of the peritoneum has an upper limit, for the ureter must leave the peritoneum in taking its oblique course posteriorly to the kidney pelvis. The point at which it leaves the peritoneum is about 4 to 6 cm. below the renal sinus. . . . Any force which displaces the kidney will have no effect on the ureter, so that, the kidney becoming displaced downward, the upper fixed point of the ureter where it leaves the peritoneum becomes the point of kinking.

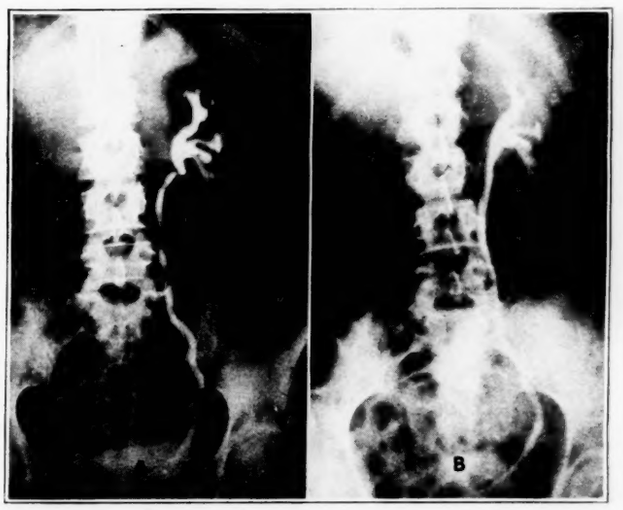

Fig. 1.—*A*, deep inspiration; marked angulation at ureteropelvic juncture; *B*, expiration; angulation disappeared.

Keeping Crosbie's explanation in mind, it occurred to us that the roentgen-ray technician's call of "take a deep breath and hold it" might explain the formation of symptomless kinks in the ureter. We therefore made pyelograms of patients who were holding a deep breath and also after expiration. A horizontal position of the patient's body was maintained at both exposures in order that gravity or position would have nothing to do with the situation of the kidney. In every case, when its position was compared to the fixed vertebrae, the kidney was found to be displaced downward by deep inspiration. In some cases, a kink was produced by the deep inspiration and the second exposure showed the ureter to be perfectly straight. Thus we found the explanation for the cases referred to earlier, in which kinks had been demonstrated elsewhere and still our ureterograms disclosed a normal condition.

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* From the Section on Urology, the Mayo Clinic.

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2. Sisk, I. R.: Kinks of the Ureter, J. Urol. **12:** 223-236 (Sept.) 1924.

3. Crosbie, A. H.: Kinks of the Ureter Due to Aberrant Vessels, Boston M. & S. J. **188:** 678-687 (May 3) 1923.

Reports of three of the cases in which we demonstrated symptomless kinks follow, together with ureterograms before and after deep inspiration.

REPORT OF CASES

CASE 1.—A woman, aged 51, came to the clinic, Jan. 26, 1929, because of frequency, nocturia and dysuria, and suprapubic distress relieved by voiding. Analysis of the urine gave

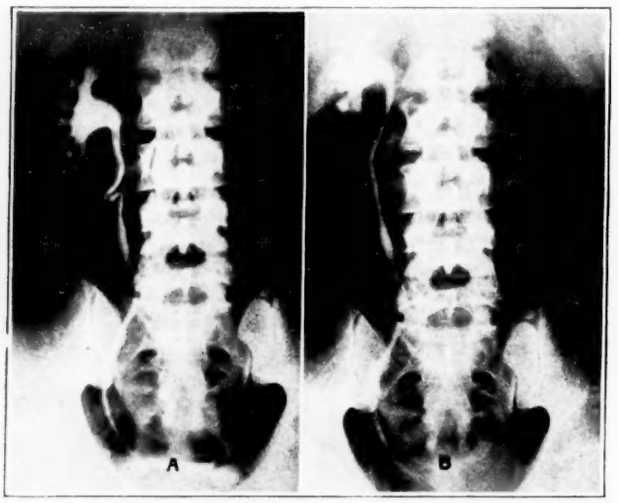

Fig. 2.—*A*, deep inspiration; marked angulation in upper third of ureter and downward displacement of kidney; *B*, expiration; position of kidney several inches higher and ureter straightened.

negative results, but, on cystoscopic examination, interstitial cystitis was found, for which treatment by overdistention of the bladder was given, and the symptoms were relieved.

The patient returned to the clinic, July 1, 1929, with the same complaint, and requested another treatment by overdistention of the bladder. Because there was some radiation of the suprapubic pain up along the left ureter, it was catheterized,

Fig. 3.—*A*, perfectly straight ureter; one shadow apparently is included in that of the kidney; another is excluded, necessitating a second pyelogram; *B*, angulation in the upper part of the ureter; this was discovered in the subsequent pyelogram for further identification of the shadows.

but normal urine was obtained. The pain was not referred to the renal region. A pyelogram disclosed angulation at the ureteropelvic juncture (fig. 1 *A*). A pyelogram five days later, made at the end of expiration, showed the ureter to be perfectly straight (fig. 1 *B*). The bladder was overdistended, and marked relief of symptoms resulted.

CASE 2.—A man, aged 31, on previous admissions had been treated for a low-grade epithelioma of the nose and gonorrheal urethritis. He came to the clinic again, June 4, 1929, complaining of frequency and burning, and indefinite pain over the regions of the kidneys. Cystoscopic examination disclosed prostatitis, with cystitis and pyelonephritis. A pyelogram (fig. 2 *A*) disclosed kinking of the ureter but otherwise nothing abnormal. The patient was treated for the prostatitis, with complete relief of all symptoms, and a pyelogram made after complete expiration gave no evidence of a kink in the ureter (fig. 2 *B*).

CASE 3.—A man, aged 54, came to the clinic, July 19, 1929, with a complaint of recurrent attacks of pain in the left upper part of the abdomen, radiating back to the region of the kidney. A stone in the left renal pelvis was diagnosed. Another shadow in the left renal region was definitely excluded. Figure 3 shows the definite angulation of the ureter which disappeared on expiration. At operation, a calculus 2 cm. long and 1 cm. wide was removed from the pelvis of the left kidney, at which time there was no evidence of kinking of the ureter.

SUMMARY

Kinks of the ureter may be present without symptoms; their correction by surgical measures should be delayed until urinary stasis is demonstrated.

THE EFFECT OF INJECTIONS OF IODIZED OIL IN THE SPINAL SUBARACHNOID SPACE *

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The use of iodized oil as a radiodiagnostic medium dates back a relatively brief period to 1922. Before that time iodized oils had been used as a form of iodine medication and for some time had been administered hypodermically. The opacity of iodized oil to the roentgen ray had been noted accidentally in the course of incidental x-ray plates of parts into which it had been injected. Sicard and Forestier [1] suggested its use as a method of making the epidural and subdural spaces roentgenologically visible. At the same time they began to use it in roentgenographic exploration of the pulmonary spaces.

Since that time there has been a constantly increasing number of reports on its use by the original authors and by many others. By far the greatest volume of the literature is concerned with the use of iodized oils as a contrast medium in the roentgen diagnosis of diseases of the central nervous system and respiratory tract. However, they have also been used to make roentgenologically visible the uterus and tubes,[2] the pouch of Douglas,[3] the ducts of the salivary glands,[4]

* From the Laboratory of Surgical Research, Northwestern University Medical School.

1. Sicard, J. A., and Forestier, J.: Iodized Oil as a Contrast Medium in Radioscopy, Bull. et mém. Soc. méd. d. hôp. de Paris **46:** 463 (March 17) 1932.

2. Newell, Q. U.: Use of Iodized Oil (Iodipin) as a Diagnostic Aid in Gynecology, Am. J. Obst. & Gynec. **12:** 189 (Aug.) 1926. Rubin, I. C., and Bendick, A. J.: Fluoroscopic Visualization of Tubal Peristalsis in Women: Uterotubal Roentgenography with Lipiodol, J. A. M. A. **87:** 657 (Aug. 28) 1926. Randall, L. M.: Lipiodol Injections of Uterus and Oviducts, Am. J. Obst. & Gynec. **13:** 457 (April) 1927. Bertrand, Villemur and Baillat: Roentgenologic Exploration of Douglas' Pouch by Injection of Lipiodol, Presse méd. **34:** 1139 (Sept. 8) 1926. Stein, I. F., and Arens, R. A.: Iodized Oil and Pneumoperitoneum Combined in Gynecologic Diagnosis: Preliminary Report, J. A. M. A. **87:** 1299 (Oct. 16) 1926.

3. Bertrand, Villemur and Baillat (footnote 2). Stein and Arens (footnote 2).

4. Carlsten, D. B.: Lipiodol Injections in Duct of Salivary Glands, Acta radiol. **6:** 221, 1926.

the accessory nasal sinuses,[5] cystic cavities and fistulous tracts,[6] the blood vessels,[7] the medullary cavities of bones,[8] and the urethra, bladder and ureters.[9]

It is a common observation that the advent of a new therapeutic or diagnostic procedure often may be followed by such a wave of enthusiasm in its favor that it is applied early in fields beyond the limits warranted by knowledge of its potential dangers. So with the iodized oils, following their application as radiodiagnostic aids their field of therapeutic application quickly widened. They have been endorsed as agents for the treatment of tuberculous pericarditis,[10] and as analgesics in sciatic neuralgia, lumbago, intercostal neuralgia, metatarsalgia and certain forms of facial neuralgia.[11] Because of the reaction produced, iodized oil has been credited with being the causative agent in resorption of the exudate and as effecting permanent cure in the serofibrinous exudates of pleurisy, tuberculous ascites and the serous effusions of joint cavities.[11] It has been advocated in the treatment of syringomyelia,[12] and in coccygodynia, nocturnal urinary incontinence and lumbosacral arthritis,[13] while in the treatment of certain pulmonary conditions it has found a large number of supporters.

It may be noted that while much of the literature is concerned with the details of the technicalities of the use of iodized oil and with the interpretation of the roentgenograms obtained, comparatively little space is devoted to any mention of its reaction on the tissues with which it comes in contact.

Newell [2] found no signs of irritation in normal fallopian tubes removed ten days after the injection of iodized oil and observed no unfavorable reactions in the abdomens of thirty patients opened at intervals of from one to fourteen days after intra-uterine injection of the oil. Nor did he note any irritating effects resulting from iodized oil that had passed through the tubes into the tissues of the pelvis.

Moller and von Magnus [14] state that injections of small doses (from 1 to 2 cc.) into the pleura in cases of pleuritis caused long continued rises in temperature. They noted an increased expectoration for a few days after intratracheal injection and in an isolated case a rise in temperature to 38 C. (100.4 F.). Archibald and Brown [15] reported three instances of complications occurring after the use of iodized oil, one of which was fatal, to show its potential dangers in cases of tuberculosis and infections of the upper respiratory tract. Lichtwitz [16] reported a case in which, after an intratracheal injection of 4 cc. of iodized oil for bronchographic purposes in a young woman with tuberculosis, the temperature rose on the same evening and the tuberculosis became rapidly progressive. Iglauer [17] found dyspnea during and shortly after intratracheal injections in a few patients. He stated also that fever frequently followed the injections but usually subsided in a day or two, although expectoration was increased for a few days. Fried and Whittaker,[18] working with cats, gained the impression that from 1 to 1.5 cc. of iodized oil per kilogram injected intratracheally did no harm to healthy cats, but doses exceeding that amount not infrequently caused death. Microscopically they observed that the pulmonary reaction stirred up in the lungs by the iodized oil was confined to the cells lining the alveolar wall. These cells were transformed into wandering phagocytes which devoured and stored the oil and proliferated into the formation of large cellular masses, with a resultant localized destruction of the normal pulmonary structures.

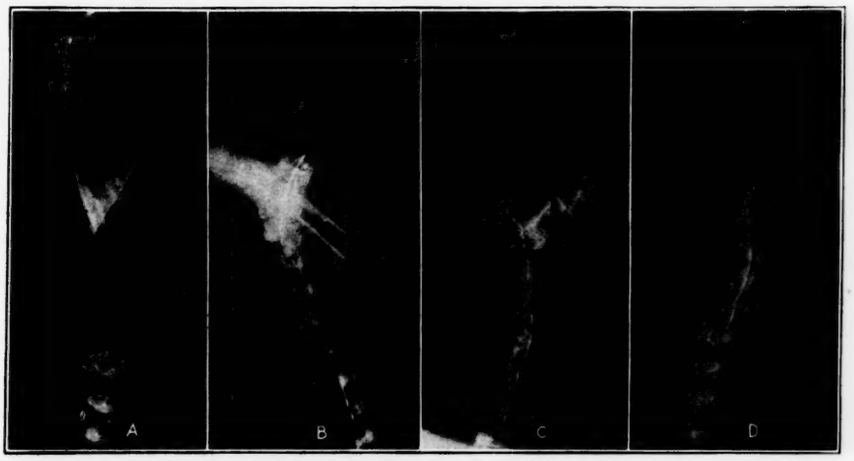

Fig. 1.—Appearance of spine of dog: *A*, one-half hour after injection of iodized oil intracisternally; *B*, forty-eight hours after injection; *C*, three weeks after injection; *D*, six weeks after injection.

Sicard and Forestier [1] found that the injection of iodized oil into the lumbar muscles was not accompanied by deleterious results and was not followed by an inflammatory reaction in the skin or induration of the surrounding parts. There was no tendency noted toward the formation of cysts such as follow the injec-

5. MacCready, P. B.: Iodized Oil as an Aid in Diagnosis of Chronic Sinusitis and of Maxillary Cysts, Boston M. & S. J. **195:** 464 (Sept. 2) 1926. Goodyear, H. M.: Iodized Oil in Diagnosis of Nasal Sinus Conditions, Arch. Otolaryng. **4:** 223 (Sept.) 1926.

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9. Neuswanger, C. H.: Iodized Oil as a Pyelographic Medium, Surg. Gynec. Obst. **43:** 169 (Aug.) 1926. Belfield, W. T., and Rolnick, H. C.: Vesiculography by Means of Iodized Oils, J. Urol. **16:** 73 (July) 1926.

10. Le Maire, A.: Tuberculous Pericarditis Treated with Local Injections of Lipiodol, Bull. et mém. Soc. méd. d. hôp. de Paris **50:** 166 (Feb. 5) 1926. Castex, M. R.; Carelli, H., and Gonzalez, H.: Lipiodol in Radiologic Exploration of the Pericardium, ibid. **50:** 217 (Feb. 12) 1926.

11. Sicard, J. A., and Forestier, J.: Iodized Oil in Diagnosis and Therapeutics, Bull. et mém. Soc. méd. d. hôp. de Paris **47:** 309 (Feb. 23) 1923.

12. Sicard, J. A.; Hageneau, J., and Mayer, C.: Lipiodol Exploration in Syringomyelitis: Laminectomy, Puncture, Recovery, Rev. Neurol. **2:** 418 (Nov.) 1926.

13. Sicard and Coste: Therapeutic Epidural Injection of Iodized Oil, Bull. et mém. Soc. méd. d. hôp. de Paris **48:** 242 (Feb. 29) 1924.

14. Moller, P. F., and von Magnus, R.: Investigations of Bronchial Affections by Means of Iodine Preparations, Acta med. Scandinav. **63:** 174, 1925.

15. Archibald, E. W., and Brown, A. L.: Dangers of Introducing Iodized Oil into the Tracheobronchial System, J. A. M. A. **88:** 1310 (April 23) 1927.

16. Lichtwitz, O.: Injury by Lipiodol as Contrast Substance in Pulmonary Tuberculosis, Wien. klin. Wchnschr. **39:** 133 (Jan. 28) 1926.

17. Iglauer, Samuel: Use of Injected Iodized Oil in Roentgen-Ray Diagnosis of Laryngeal, Tracheal and Bronchopulmonary Conditions, J. A. M. A. **86:** 1879 (June 19) 1926.

18. Fried, B. M., and Whittaker, L. R.: Intratracheal Injection: Experimental Studies, Arch. Int. Med. **40:** 726 (Nov.) 1927.

tion of mineral fats. They mention, however, that epidural and subarachnoid injections were accompanied by pain, formication and tingling paresthesias of the extremities without sphincteric reactions, which lasted from a few hours to a few days with no permanent reactions. They commented on the fact that it remained in the tissues for months.

Peiper and Klose,[19] after some clinical studies and after injections into rabbits of iodized sesame oil, intraspinally and intracisternally, stated that they had seen no ill effects after two years' observation except

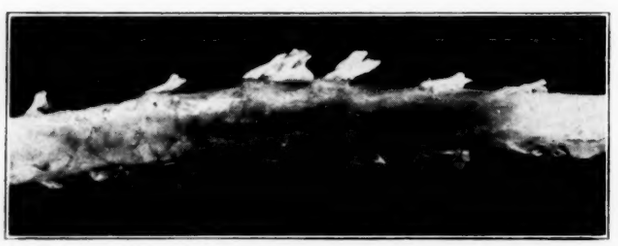

Fig. 2.—Anterior aspect of cord of dog killed fifty days after injection of iodized oil, showing discoloration of meninges.

headaches and root pains, which were easily controlled by salicylates and amidopyrine. However, they described pathologic changes in the ganglion cells, wherein the Nissl bodies were clubbed and seemed washed out. The contents of the cells were pale, the sharp outline was lost, and the centrally placed cells were pale with an achromatic appearance. They also noted changes around the central canal, characterized by necrosis of the tissue immediately around the canal and a wall of leukocytes next to this necrotic layer. They offer as an explanation the observation that after the injection of the oil there is a mechanical pressure exerted on the gray matter and then on the white matter.

Ayer and Mixter,[20] after injecting iodized sesame oil intracisternally in cats, found definite irritative symptoms in all six animals injected. One cat showed a spinal fluid cell count of more than 4,000 cells the third day after injection, and one of their animals developed convulsions and died immediately after injection.

After a subdural intracranial injection of iodized oil in rabbits, Lindblom[21] noted a distinct clinical reaction which simulated meningitis and which disappeared within two weeks. Histologically, he described a sterile leptomeningitis characterized by the presence of leukocytes and lymphocytes in abundance in the meninges wherever iodized oil was located. He stated, however, that after from two to three weeks there were only single leukocytes, lymphocytes and plasma cells present and after two months no changes could be seen in spite of the fact that iodized oil could still be demonstrated in large quantities in the meninges. Sharpe and Peterson[22] and Maclaire[23] reported a clinical case in which they ascribe to iodized oil the formation of an arachnoid cyst with severe leptomeningeal reactions and a resultant spinal cord compression. In the course of a laminectomy five and one-half months after the injection of iodized oil, Bergerhoff[24] found the iodized oil encapsulated by many connective tissue adhesions and appearing as if a compression myelitis were present at the site.

19. Klose, H., and Peiper, H.: Myelography, Arch. f. klin. Chir. **134**: 303, 1925.
20. Ayer, J. B., and Mixter, W. J.: Radiography Following the Injection of Iodipin into the Spinal Subarachnoid Space, Arch. Neurol. & Psychiat. **11**: 499 (April) 1924.
21. Lindblom, A. F.: Effect of Lipiodol in the Meninges, Acta Radiol. **5**: 129, 1926.
22. Sharpe, W., and Peterson, C. A.: Danger in the Use of Lipiodol in Diagnosis of Obstructive Lesions of Spinal Cord, Ann. Surg. **83**: 32 (Jan.) 1926.
23. Maclaire, A. S.: Lipiodol in Neurosurgery with Report of Case with Deleterious Results, Am. J. M. Sc. **170**: 874, 1925.

CLINICAL USE OF IODIZED OIL

It is a well known fact that any adjunct to clinical diagnosis depends to some extent for its value on the necessity for its use. From 1925 to the present time laminectomies have been performed in thirty-one patients in the surgical service of one of us following a diagnosis of spinal cord tumor. This number does not include a rather large list of traumatic spine injuries. In twenty-three of these cases the clinical diagnosis of a spinal cord tumor was certain or at least very probable and the tumor was verified at the level of clinical localization in all but one case, in which no tumor was found. In seven cases in which operation was performed only on the suspicion of a tumor, a localized arachnoiditis was found present at the site of clinical localization in six, while in one case no pathologic condition was demonstrable. In the remaining case operation was performed under the preoperative diagnosis of arachnoiditis and this was verified at the suspected clinical level. In only two cases, both belonging to the certain tumor group, was iodized oil used and in each case it only served to confirm the previously made clinical localization. It has been generally felt by us that the introduction of iodized oil into the subarachnoid space was not entirely without danger. So far in the literature, adequate proof of its danger has been lacking.

EXPERIMENTS IN ANIMALS

For the experimental aspect of this study we attempted to make conditions simulate clinical conditions as much as possible. A group of healthy dogs was selected in which the animals weighed between 14 and 18 Kg. and averaged about 2 years of age. A laminectomy in the upper dorsal region was done on one vertebra under ether anesthesia. A piece of soft rubber drain was gently inserted between the dura and the bony

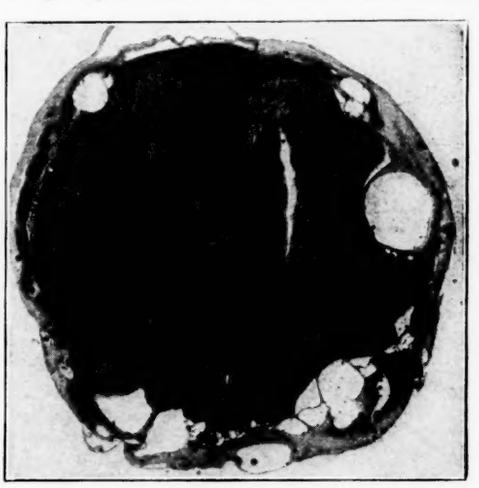

Fig. 3.—Cross-section at fifth cervical segment. Attention is called to the vacuolar spaces previously occupied by iodized oil in the leptomeninges and pressure against the cord (Herxheimer-scarlet red stain; × 10).

wall of the spinal canal immediately above. An attempt was made to produce a measure of subarachnoid space block without causing any injury to the spinal cord. The operative wound was closed and the animals were

24. Bergerhoff, W.: Harmful Effects of Iodipin Injections in Roentgen Examinations, Fortschr. a. d. Geb. d. Roentgenstrahlen. **36**: 374, 1927.

allowed to recover from the anesthesia. Then after it had been made certain that there was no injury to the cord as evidenced by possible paralyses or pareses or increased reflexes in the posterior extremities, 1.5 cc. of iodized oil [25] was injected into the subarachnoid space through a cisternal puncture. The dogs were then held with the spine in the vertical position for one-half hour, after which roentgen plates were taken. Other roentgen plates were taken after twenty-four hours and then at various intervals until the animal was killed for histologic study. The spinal cords were removed in toto with the dura mater intact and were suspended in a diluted "solution of formaldehyde-U. S. P." (1:10). After fixation they were cut and sections selected from the middle of the lumbar enlargement, the middorsal region, the level just above the subarachnoid space block and the upper cervical region. These were stained with hematoxylin-eosin, cresyl violet, Herxheimer's scarlet red, Van Gieson's stain, Weil's Pal-Weigert stain and according to the silver method of Cajal for microscopic study.

Control dogs were subjected to this operative procedure without injection of iodized oil. All dogs which showed the slightest evidence of spinal cord lesion following the operative procedure were rejected as unsuitable for injection. In all, ten dogs were injected with iodized oil following this method of subarachnoid block. Their cords were studied histologically at intervals varying from three to 252 days after injection.

Eight of the animals showed definite clinical indications of the irritative action of the iodized oil. This was evidenced by a general appearance of malaise, a sluggishness tending toward stupor in some, and a lack of appetite. These symptoms disappeared in from twenty-four to forty-eight hours in all but one animal, which died the third day after injection apparently

Fig. 4.—Leptomeningeal reaction that follows injection of iodized oil, 110 days after injection: *A*, van Gieson stain of seventh cervical segment; *B*, hematoxylin and eosin stain of third dorsal segment, ninety days after injection of iodized oil; *C*, portion of *B*. The cellular reaction consists of large mononuclears, macrophages, small lymphocytes and plasma cells, with a few polymorphonuclears. Reduced from photomicrographs with a magnification of: *A*, 36; *B*, 36, and *C*, 395 diameters.

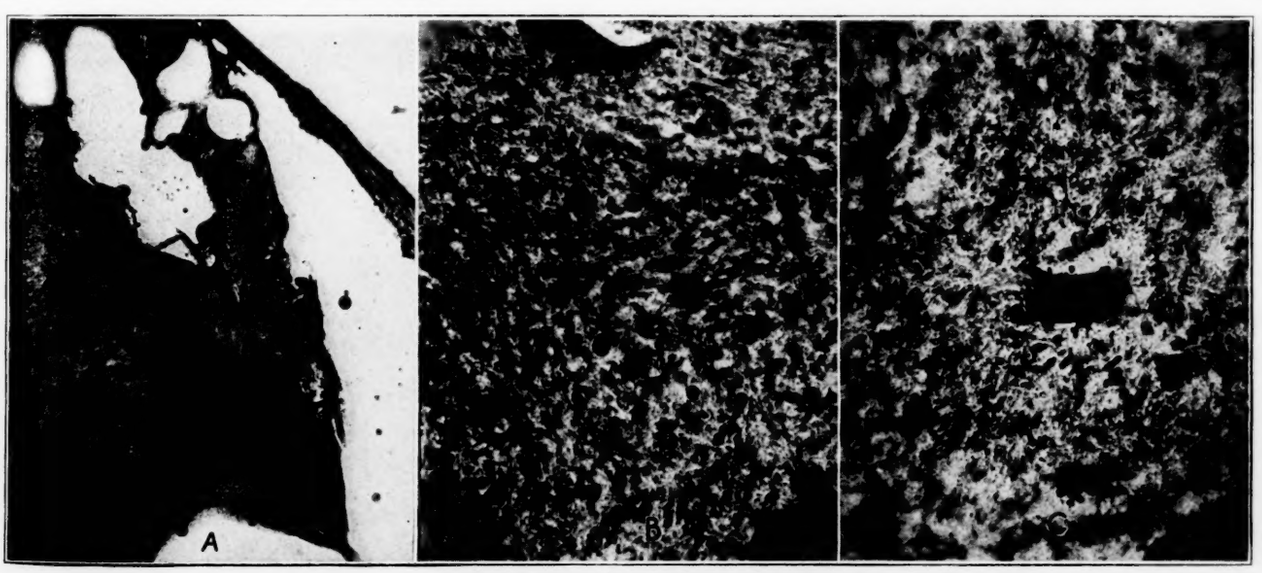

Fig. 5.—*A*, fat encystment in leptomeningeal space, fifth cervical segment, 252 days after injection of iodized oil; *B*, fat in posterior columns, middorsal region; *C*, fat in anterior horn cells. Reduced from photomicrographs with a magnification of: *A*, 36; *B*, 395 (Herxheimer's stain).

25. In all these experiments, lipiodol-Lafay was the iodized oil employed.

as the result of the reaction. This animal and another, which apparently recovered from the general reaction, had a spastic paraplegia in the hind limbs following the injection. No cause other than the effect of the iodized oil could be assigned. One animal, after recovering from the initial reaction and being apparently normal for one week, developed a spastic paralysis of the right hind leg which persisted for five months, after which it gradually became better. Seven months after injection this animal was apparently normal in every respect and remained so until he was killed eight and one-half months after injection. Two of the animals showed no immediate or delayed clinical manifestations of a reaction.

Pathologically the gross examination of the spinal cords revealed in all cases but one a normal appearance except for a fairly well marked increase in vascular markings in the anterior half of the lower cervical and upper dorsal regions. No evidence of hemorrhage, dural thickening or deformity could be made out. One animal which showed no clinical reaction, and which was apparently normal when killed on the fiftieth day after injection, showed a dark bluish-red discoloration in the dura, about 2½ inches (6.3 cm.) long on the anterior aspect of the cord, which extended from the level of the subarachnoid space block upward. The discolored area faded out with pink tinted edges and the vascular markings were unusually prominent below and above it. Oil droplets could be made out around the area. It appeared grossly to be a hemorrhagic pachymeningitis.

The microscopic examination revealed changes in all of the cords that were examined. The degree of change was directly proportional to the length of time during which the injected oil remained in the subarachnoid space. The cords of the dogs which were killed early were almost similar microscopically to the cords of the dogs which were killed later except for the degree of involvement and in a few instances the location of the involvement.

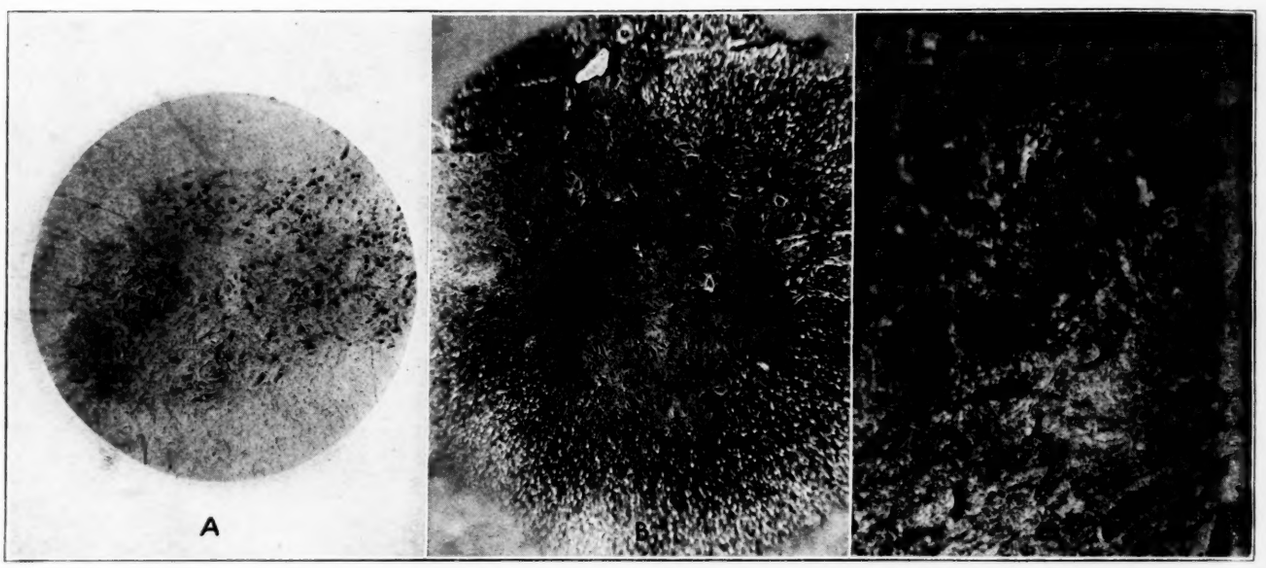

Fig. 6.—*A*, anterior horn of fourth lumbar segment showing normal arrangement of ganglion cells; *B*, anterior horn of fourth lumbar level 252 days after injection of iodized oil showing abnormal shapes and decrease in number of ganglion cells; *C*, fourth lumbar segment showing increased pigmentation and washing out of cytoplasm in ganglion cells of anterior horn (Cresyl violet stain). Reduced from a photomicrograph with a magnification of 295 diameters.

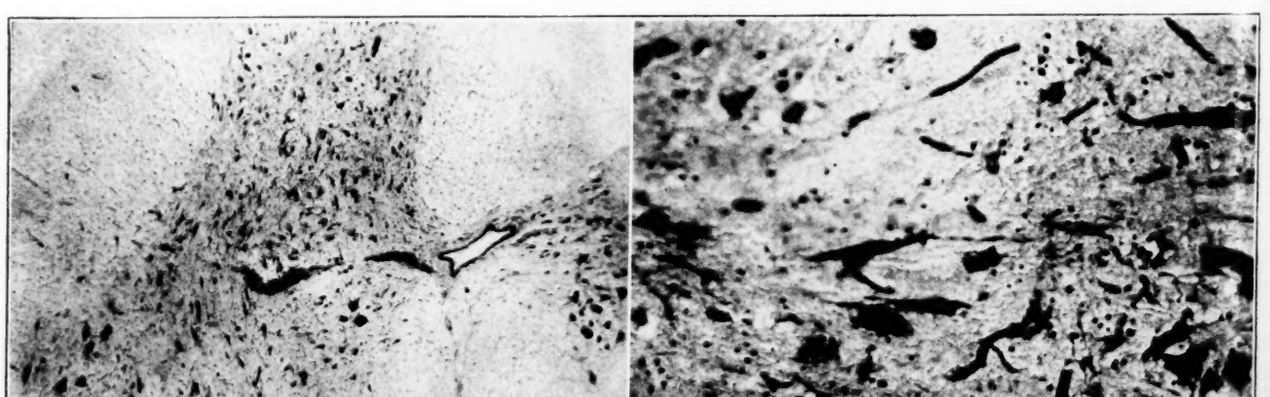

Fig. 7.—*A*, third dorsal segment of cord showing thrombosis of vessels and decrease in number of ganglion cells in anterior horn; *B*, third lumbar segment showing increased vascularity in anterior horn. Reduced from photomicrographs with a magnification of: *A*, 36; *B*, 295 (Cresyl violet stain).

The most common pathologic change seen was a marked leptomeningeal reaction. This consisted of an accumulation of large mononuclear, small mononuclear, macrophage, polymorphonuclear and plasma cells. No organisms were found in any of the sections studied. Fat substances and inert matter were seen as inclusion bodies in the macrophages of the subarachnoid spaces. The entire picture of the leptomeningeal space was that of an acute aseptic leptomeningitis. Van Gieson stained sections showed enlargement of the vessels and thickening of their walls in the anterior aspect of the cord. In addition to the cellular reaction described there were seen many round or circular spaces of varous sizes surrounded by thickened leptomeninges. The borders of these spaces contained many round droplets of material which stained dark red with Herxheimer's stain, and in some instances the spaces were entirely filled with it. This encysted fat was more often seen on the ventral and only occasionally on the dorsal aspect of the cord. While there was some present in a few cases below the level of the block, the fat was much more in evidence in the lower cervical and upper dorsal regions in the areas just above the subarachnoid block. In these areas the arachnoid membrane showed thickening with enlargement of its cells. In several instances, large clusters of cells could be made out in the arachnoid. There were also noted numerous red staining areas, usually circular but in some cases of irregular shape, and intimately associated with the surrounding cellular structures in the marginal areas of the cord stained by the method of Herxheimer. Care was exercised in interpreting these areas as part of the actual structure and not artefacts.

The gray matter presented a considerable amount of abnormality. With the nuclear stains (toluidine blue and cresyl violet) the anterior horns showed marked involvement. There was noted an absolute decrease in the number of ganglion cells. In the cervicodorsal region, particularly, the motor ganglion cells were decreased to about one-half the normal number for that region. The shape of the remaining cells was changed so that most of them were shrunken and irregular, although a few cells were increased in size. Their processes were stained indistinctly or not at all. The nuclei were dimly stained and in many cells had become eccentrically placed. In a few cells there was no nucleus visible. The cytoplasm for the most part was homogeneously stained, especially in the enlarged cells. A fairly normal ganglion cell was seen only occasionally. The cytoplasm of the shrunken and irregular cells was either stained excessively or took no stain at all. There was no orderly involvement of any of the groups of anterior horn cells, but all were involved equally, so that it was impossible to recognize the various groups with any degree of certainty. There was no evidence of neuronophagia seen in any of the sections.

Van Gieson stains revealed an increase in the vascular structures of the anterior horns. Many new capillaries were easily seen. The blood vessels of the anterior half of the gray matter were thrombosed in many instances. There was no perivascular infiltration around any of the blood vessels. Only occasionally could one see an increased vascularity of the posterior half of the gray matter. There were no abnormal changes seen in the cellular elements of the posterior horns of the gray matter. The central canal in most instances was distended with cellular elements, chiefly small round cells.

In the Herxheimer stained sections from the cords of the dogs which were killed very late, irregular red masses of various sizes were seen in the anterior horns. In two cases these masses were definitely located in the cytoplasm of a ganglion cell. Usually, however, these fatty areas were situated between the ganglion cells.

No evidence of neuroglial proliferation was seen in the gray matter with the silver stains.

CONCLUSIONS

1. In twenty-nine of thirty-one cases a definite clinical localization was possible without the use of iodized oil as a diagnostic aid. We believe, therefore, that in the great majority of cases a definite spinal cord localization can be made by careful clinical examination.

2. In ten animals injected with iodized oil intracisternally, definite evidences of leptomeningeal reaction, fat encystment and degenerative changes in the gray matter were found. We conclude, therefore, that the injection of iodized oil into the subarachnoid space is to be regarded as a dangerous procedure.

54 East Erie Street.

POLIOMYELITIS ANTISTREPTOCOCCUS SERUM

FURTHER STUDIES ON THE BACTERIOLOGY AND SERUM TREATMENT OF POLIOMYELITIS *

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The isolation of a streptococcus having peculiar neurotropic [1] and immunologic properties,[2] from the throat,[3] spinal fluid,[4] and brain and cord in poliomyelitis, its demonstration in the throat by the precipitin reaction,[5] its microscopic demonstration in the lesions after death [3] and in the spinal fluid during life,[4] as well as its probable relation [6] to the globoid bodies cultivated by Flexner and Noguchi, and the results from the use of antiserum prepared with this streptococcus in the treatment of poliomyelitis, have been recorded in a series of published reports.[7]

In the most recent publication by Rosenow and Nickel [8] on the use of this serum in treatment, it was shown, as previously, that the mortality rate and incidence of residual paralysis were much lower in a

* From the Division of Experimental Bacteriology, the Mayo Foundation.

* Read before the Section on Orthopedic Surgery at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 11, 1929.

* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the author's reprints.

1. Rosenow, E. C.; Towne, E. B., and von Hess, C. L.: The Elective Localization of Streptococci from Epidemic Poliomyelitis, J. Infect. Dis. **22**: 313-344 (April) 1918. Rosenow, E. C., and Wheeler, G. W.: Etiology of Epidemic Poliomyelitis, ibid. **22**: 281-311 (April) 1918.

2. Rosenow, E. C., and Gray, Hazel: Agglutination of the Pleomorphic Streptococcus Isolated from Epidemic Poliomyelitis by Immune Serum, J. Infect. Dis. **22**: 345-378 (April) 1918.

3. Rosenow and Wheeler (footnote 1).

4. Rosenow, E. C.: Streptococci in the Spinal Fluid in Acute Epidemic Poliomyelitis: Preliminary Report, J. A. M. A. **91**: 1594-1595 (Nov. 24) 1928.

5. Rosenow, E. C.: A Specific Precipitin Reaction in Epidemic Poliomyelitis, J. A. M. A. **84**: 429-432 (Feb. 7) 1925; Further Studies of the Poliomyelitis Precipitin Reaction, J. Infect. Dis. **38**: 532-540 (June) 1926.

6. Rosenow, E. C., and Towne, E. B.: Bacteriologic Observations in Experimental Poliomyelitis of Monkeys, J. M. Research **36**: 175-186 (March) 1917.

7. Rosenow, E. C.: Report on the Treatment of Fifty-Eight Cases of Epidemic Poliomyelitis with Immune Horse Serum, J. Infect. Dis. **22**: 379-426 (April) 1918; Treatment of Acute Poliomyelitis with Immune Horse Serum: Summary of Results, J. A. M. A. **72**: 588-599 (Aug. 20) 1921.

8. Rosenow, E. C., and Nickel, A. C.: The Treatment of Acute Poliomyelitis with Poliomyelitis Antistreptococcus Serum: Results During 1921 to 1925, Am. J. Dis. Child. **33**: 27-49 (Jan.) 1927.

large number of cases (1,113) in which treatment was carried out with this serum over a five-year period than in the control cases in which such treatment was not carried out. The good effects noted at the bedside and on statistical analysis, manifested by a greatly reduced mortality rate (from 29 to 2.9 per cent) and incidence of residual paralysis, were most marked when the serum was given in the early stages of the disease. But

Fig. 1.—Diplococci in the spinal fluid in three cases of acute poliomyelitis: *a*, case 1, third day of disease, cell count, 232; *b*, case 2, second day of disease, cell count, 36; *c*, case 3, fourth day, cell count, 371; *d*, case 3, fifth day; *e*, case 3, after death; Gram and safranin stain; slightly reduced from a photomicrograph with a magnification of 1,000.

even in those cases in which the first injection of serum was given after marked paralysis had developed it seemed to have curative power, for even here the mortality rate was less than half that in the control cases. The death rate was consistently much lower in the cases in which serum was given than in the control cases in each of nine epidemic outbreaks. The serum used possessed the power to neutralize the toxic material contained in the cultures of the streptococcus as measured by intracutaneous injection.[9] It diminished the infective power in vitro of the streptococcus, as measured by intracerebral injection, and it cured rabbits inoculated intravenously with the streptococcus.[10] It neutralized poliomyelitis virus in vitro and protected monkeys against poliomyelitis in some instances, properties not possessed by normal horse serum. However, despite these striking results, there is still much skepticism regarding the value of this method of treatment. There are a number of reasons why this still exists. The enthusiasm over strikingly favorable results is clouded considerably by the deplorable reaction from the serum which often occurs a week or ten days later. The chance for obtaining the best results is often lost through delay, for one reason or another, in making the diagnosis and in administering the serum. The outcome in poliomyelitis varies within such wide limits that only the most striking clinical evidence in a long series of cases in many different epidemics can be expected to win the universal acceptance of any method of treatment in this disease.

Since the "virus" of poliomyelitis is filtrable, much doubt still exists as regards the etiologic significance of the streptococcus with which this serum is prepared, despite the mass of evidence which indicates that it must in some way bear etiologic relationship to this disease. Then, too, a number of workers [11] have reported experimental results in which they have failed to corroborate my data. The reasons for discrepancies between their results and mine will be considered in detail in future publications; suffice it to state here that such failure of repetition of results appears to be explainable by differences in the material studied, in the number of experiments performed, and in the technic employed.

In this paper I report further results obtained with newly prepared antistreptococcus serums in the treatment of an additional series of cases of acute poliomyelitis, and summarize the results I have had in a long series of experiments under controlled conditions, covering a period of ten years: (1) on the treatment of experimental poliomyelitis in the monkey; (2) in experiments on neutralization of poliomyelitis virus with various batches of the serum that have been used therapeutically, and (3) in numerous attempts at immunization of monkeys with the "poliomyelitis" streptococcus.

CLINICAL AND EXPERIMENTAL DATA

The cases included in the present report comprise two groups. One group consists of twenty-one cases of poliomyelitis in which I was called in consultation with the attending physicians during an epidemic that occurred in the vicinity of Rochester, Minn., late in the summer of 1928; the other group consists of 137 cases reported by physicians to whom the serum was sent on request, for study, in different parts of the United States and Canada.

The epidemic outbreak studied in the summer of 1928 was peculiar in a number of respects. During the early part of the epidemic young adults and children aged more than 11 years were chiefly affected; of the first eleven patients only three were aged less than 11 years, and the remainder were aged between 11 and 22 years. Of the next ten patients, only two were more than 9. Most of the patients lived in the country, often on farms in sparsely settled, relatively inaccessible

Fig. 2.—Diplococci in the spinal fluid of a monkey on the second day after the onset of a mild attack of poliomyelitis following intracerebral inoculation of glycerolated virus from the fatal case referred to in figure 1, in the second passage through monkeys. This animal had been immunized with the streptococcus several months before and had resisted a previous injection of virus. Control smears of the spinal fluid at the time of inoculation were negative. Gram and safranin stain; × 1,000.

9. Rosenow, E. C.: A Skin Reaction in Poliomyelitis, J. Infect. Dis. **38**: 529-531 (June) 1926.

10. Rosenow, E. C.: Treatment of Acute Poliomyelitis with Immune Horse Serum: Further Studies, J. A. M. A. **71**: 433-437 (Aug. 10) 1918.

11. Long, P. H.; Olitsky, P. K., and Stewart, F. W.: The Rôle of Streptococci in Experimental Poliomyelitis of the Monkey, J. Exper. Med. **48**: 431-448 (Sept.) 1928.

regions. Evidence of possible contact infection was obtainable in only two cases. The epidemic of poliomyelitis followed a widespread prevalence, in the same region, of epidemic nausea and vomiting associated with other manifestations, such as diaphragmodynia, believed also of central origin, seemingly the result of irritation of the medulla. An unusually large proportion of the patients had primary symptoms of high poliomyelitis (thirteen of the twenty-one) in which paralysis began very soon after a stormy onset of the disease. Gastro-intestinal symptoms, aside from vomiting which often seemed projectile in character, were almost wholly lacking. Constipation was present in a number of cases. Diarrhea was not a prominent symptom in a single case. Sensitiveness to light and pain back of the eyeballs were common. The eyes were often prominent, the conjunctiva was congested and the pupils were sometimes unequal and dilated. Symptoms referable to infection of the throat and nose, with few exceptions, were mild or absent, especially during the early part of the epidemic, although a reddened throat, infected tonsils, enlarged cervical lymph nodes or carious teeth were found in a large proportion of the cases. The pulse rate in this as in other epidemics was very rapid and out of proportion to the temperature. Headache, rigidity of the neck, pain in one or more of the extremities without swelling or localized redness, and reflexes, unequal at first, exaggerated and then diminished or lost, occurred in the usual number of cases. Loosely adherent mucopurulent exudate was commonly found high in the nasopharynx, and the ends of cotton swabs were often stained with blood after the customary high nasopharyngeal swabbings had been made with appropriately bent wire swabs for precipitin tests, cultures and animal inoculations. Smears from these swabs often revealed the presence of large numbers of gram-positive pleomorphic diplococci free and within epithelial cells. Blood agar platings almost invariably showed large numbers of colonies of green-producing streptococci together with the usual number of colonies of *Micrococcus catarrhalis* and staphylococci. In only one patient, who had had acute tonsillitis shortly before his attack, were hemolytic streptococci found in large numbers.

In one or more rabbits inoculated intracerebrally with small amounts of suspensions of the nasopharyngeal swabbings in gelatin (0.2 per cent) -Locke solution, symptoms of meningo-encephalomyelitis developed in which paralysis was especially marked in all but one of the twenty-one cases studied from this standpoint. A green-producing streptococcus was isolated from pipettings of the brain and cord, often in pure culture, from the animals that succumbed, and each of the twenty strains thus obtained was agglutinated specifically, but to a variable degree, by the poliomyelitis and encephalitis antistreptococcus serums. The precipitin reaction with the cleared suspension in gelatin-Locke solution of the nasopharyngeal swabbings and the poliomyelitis antistreptococcus serum was positive in each of fourteen cases of frank poliomyelitis in which this test was made, in six of eight abortive cases, and in fourteen of eighteen normal subjects of the family groups in which poliomyelitis occurred. The details of the animal experiments and of other experiments will be published later, together with those in connection with other epidemics.

The spinal puncture in the twenty-one cases was made on the first day of illness in four cases, on the second day in nine, on the fourth day in four, on the fifth day in three, and on the seventh day in one case. The cell counts ranged from 15 to 1,270. The average count was 220. The cells were chiefly polymorphonuclear leukocytes in the cases in which spinal puncture was made on the first and second days of the disease; there were about equal numbers of these cells and lymphocytes in the fluids obtained on the fourth day of illness and a preponderance of lymphocytes in those obtained on the fifth and seventh days. As reported previously, carefully made and stained smears of the sediment of thoroughly centrifugated fluids revealed unmistakable gram-positive diplococci (fig. 1) of varying size in each of eighteen consecutive cases. Diplococci were found as early as twelve hours after the onset of symptoms in the preparalytic stage, and as late as five days after the onset of paralysis.[4] They were found in five additional cases reported to me by other physicians who used the serum. Moreover, similar diplococci (fig. 2) were found in similarly prepared smears of the spinal fluid in each of three monkeys injected with glycerolated virus from three fatal cases in this epidemic and twice or oftener during life in each of nine additional monkeys in which typical poliomyelitis developed following inoculation of glycerolated virus or filtrate of virus which had previously been passed through monkeys many times; this is in sharp contrast to the negative results reported by Olitsky, Rhoads and Long.[12] The diplococci of varying size, some resembling "globoid" bodies, were found singly, in small clumps, and in short chains, usually free but occasionally within leukocytes and round cells. Control smears of spinal fluid from human beings with other diseases, such as syphilis and brain tumor, from normal monkeys, and from the monkeys at the time of injection of the virus, were uniformly negative. Extreme difficulty has been experienced in obtaining cultures from the spinal fluid even when smears showed goodly numbers of diplococci. However, I have succeeded in isolating the streptococcus having on isolation peculiar infecting power and immunologic properties in pure culture from the spinal fluid during life in five cases and after death in two cases,[13] from the spinal fluid in each of three monkeys in which typical poliomyelitis developed following inoculation of the virus directly from three fatal cases, and from one of nine monkeys in which poliomyelitis developed after the injection of adapted virus.

RESULTS OF SERUM TREATMENT IN CLINICAL CASES

All injections of the serum in treating patients were given intramuscularly, usually followed by rather vigorous massage to facilitate absorption. The method of preparing the serum was similar to that used heretofore; suffice it to state that the horses received increasing amounts of the freshly isolated streptococcus preserved in dense suspensions of glycerin and sodium chloride solution instead of saprophytized cultures. Altogether, 356 injections were given in the 158 cases. The amount injected varied from 5 to 160 cc. in the different cases; the average amount given in each case was 62 cc. In most cases two or more injections were given from twelve to twenty-four hours apart, and as many as six were given in several cases. The whole unconcentrated serum was given in all but ten cases.

12. Olitsky, P. K.; Rhoads, C. P., and Long, P. H.: Relation of Streptococci to the Spinal Fluid of Experimental Poliomyelitis, J. A. M. A. **92**: 1725-1727 (May 25) 1929.

13. Nuzum, J. W.: Bacteriologic Findings in Cerebrospinal Fluid in Poliomyelitis, J. A. M. A. **67**: 1437-1439 (Nov. 11) 1916. Rosenow (footnote 4).

Reaction to the serum occurred immediately in twelve cases; in three cases it was severe, in three moderate, and in six slight. Previous desensitization, with few exceptions, was not done unless there was a history of sensitiveness to horse serum, asthma or hay-fever. The condition of the patients was not made worse by these early reactions nor did a reaction to the serum occur in any of the fatal cases. Late reaction to the serum occurred in 106 of the 142 patients who recovered and who received whole serum. The late reaction was considered severe by the attending physicians in forty-eight cases, moderate in forty, and slight in eighteen. Immediate or late reactions did not occur in any of the ten cases in which the concentrated (globulin) serum was given. The drop in temperature and the disappearance of symptoms were especially striking in the cases in which the concentrated serum was given. In a few cases there was a rise in temperature within the first twenty-four hours after the whole serum had been given and then a drop, but in the majority of cases the temperature was lowered progressively after twenty-four or forty-eight hours, irrespective of whether the serum was given on the first or second day or as long as a week or ten days after the onset

TABLE 1.—*Mortality and Incidence of Residual Paralysis According to the Day of Disease When Serum Treatment was Begun*

		Deaths			Incidence and Degree of Residual Paralysis				
								Marked	
Day of Illness	Cases	Number	Per Cent	Recovery	None	Slight	Moderate	Cases	Per Cent
First	26	2	8	24	21	..	..	..	..
Second	39	3	8	36	29	4	3	..	..
Third	32	7	22	25	14	6	3	2	8
Fourth	24	2	8	22	14	3	3	2	9
Fifth	14	1	7	13	6	3	2	2	15
Sixth	8	..	..	8	4	1	2	1	12.5
Seventh and later	15	1	7	14	4	3	4	3	21
Total	158	16	10	142	95	20	17	10	7

of symptoms. Since the symptoms, the duration of the disease at the time of the first serum treatment, the cell counts, the injections of serum, the mortality rate (15 per cent), and the incidence of residual paralysis (6 per cent) in the twenty-one cases observed by me were so similar to the manifestations in 137 cases reported to me by other physicians, the results from the use of the serum will be considered jointly in the two series.

Of the 158 cases in the present series in which serum was given, the age groups were as follows: from 8 days to 5 years, sixty-two cases; from 6 to 10 years, forty-five cases; from 11 to 20 years, thirty-eight cases, and 21 years or more, thirteen cases.

The sex distribution was that which usually occurs in this disease, males being affected more often than females. Of the 137 cases reported to me by other physicians, sixty-two occurred chiefly during epidemic outbreaks in 1925, twenty-one in 1926, thirty-three in 1927, sixteen in 1928, and five in 1929.

As shown in table 1, the first injection of serum was given on the first day of illness in twenty-six cases, on the second day in thirty-nine, on the third day in thirty-two, on the fourth day in twenty-four, on the fifth day in fourteen, on the sixth day in eight, and on the seventh day and later in fifteen. It will be noted that the mortality rate for the first three days and the incidence of residual paralysis, particularly marked residual paralysis, was greater the longer the delay in administering the first dose of serum, the mortality rates being 8, 8 and 22 per cent, respectively, for the first three days, and marked residual paralysis 0, 0, 8, 9, 15, 12.5 and 21 per cent, respectively, for the seven successive days.

The results according to clinical and spinal fluid data, mortality rate and incidence of residual paralysis are summarized in table 2. The good effects of the serum as manifested by the occurrence of paralysis, by the mortality rate and by the incidence of residual paralysis after the serum was given are in direct proportion to its early administration, as regards both the average time after onset and the degree of paralysis when first given; this is not due to error in diagnosis in the cases in which the serum was given in the preparalytic stage, since the average cell count was higher in this group than in the other three groups.

Of the fifty cases in which serum was given in the preparalytic stage, paralysis developed in only five (10 per cent). In one of these cases, in a girl, aged 18, in whom extremely severe symptoms had already developed and whose spinal fluid showed a cell count of 1,270, paralysis developed and progressed to death from respiratory failure. In another case, in a baby, aged 8 days, with a cell count of 36, general rigidity and a temperature of 102 F., the concentrated serum was given on the second day. Paralysis did not develop, but death occurred five days later, apparently from inanition. This case should really not be counted against the serum. In two of the five cases in which paralysis developed, complete restoration of muscle function occurred later, whereas in one case (2 per cent) of the forty-eight in which the patients survived, there was slight residual paralysis.

In three (14 per cent) of the twenty-two patients in whom there was slight paralysis at the time of the first serum treatment, there was extension of the paralysis. In one of these, a boy, aged 14, who had been ill for four days and who already had difficulty in swallowing and breathing and a cell count of 373, paralysis progressed to a fatal termination in spite of the fact that three injections of serum were given. In one case, restoration of muscle function was complete whereas in two (11 per cent) of the twenty-one patients who survived, slight residual paralysis remained.

In five (16 per cent) of the thirty-one cases in which moderate paralysis had developed, there was extension of the paralysis. In several of these the paralysis had become stationary, and in the remainder progressing paralysis seemed arrested. In three cases (10 per cent) paralysis progressed to a fatal termination whereas, in nine of the twenty-eight patients who survived, slight residual paralysis remained; the remainder of the patients recovered completely. One of the three patients who died, a child, aged 5 years, with a cell count of 371, had respiratory paralysis twelve hours after one therapeutic injection of poliomyelitis antistreptococcus serum. Three injections of convalescent serum were given the day previously (the fifth day of illness) while the patient was being desensitized to horse serum and during which time the paralysis had extended from complete paralysis of the right arm to paralysis of the muscles of the left arm, throat and thorax. One patient, a girl, aged 16, with moderate bulbar paralysis on the third day, showed marked improvement for thirty-six hours following the injection of 20 cc. of serum, the total amount available. The paralysis then extended and death occurred from respiratory paralysis. The

third patient, a girl, aged 18, with primary bulbar symptoms, a cell count of 500, and unusually severe initial symptoms, died of respiratory paralysis notwithstanding that four injections of serum (120 cc. in all) were given, beginning on the second day of illness.

In eighteen (33 per cent) of the fifty-five cases in which marked paralysis had developed before serum treatment was begun, there was extension of paralysis. In ten (18 per cent) of these it progressed to a fatal termination. Of the forty-five patients in this group who survived, eleven recovered without residual paralysis; residual paralysis was slight in eight cases, moderate in sixteen, and marked in ten (22 per cent).

The significant data with regard to five patients who died and who had marked paralysis at the time of the first serum treatment will suffice to illustrate the situation. One of these patients was a girl, aged 18, with severe initial symptoms, who had marked paralysis of all extremities and the muscles of respiration on the second day, when the first injection was given. The second patient, a man, aged 31, with a cell count of 70 and marked respiratory involvement, improved following the injection of four daily doses of serum, but grew worse after an interval of two days, when a fifth injection of serum was given without apparent effect. The third patient was a boy, aged 1½ years, with a cell count of 60, who had marked paralysis of all extremities on the third day, when the first injection of serum was given, also without apparent effect. The fourth patient was a boy, aged 11, who, on the fourth day after severe onset, had marked respiratory embarrassment and a cell count of 18. He died of respiratory failure eight hours after one injection of 30 cc. of serum. The fifth patient was a man, aged 29, whose cell count was 15, and who was dying from bulbar paralysis when he was first seen. He died six hours after one injection of 15 cc. of serum on the third day of illness.

Ten (7 per cent) of the 142 patients who survived and who received serum, irrespective of the condition and time when first given, had marked residual paralysis. This is in sharp contrast to ten (38 per cent) of twenty-six control subjects who lived.

The mortality rate increased progressively in the groups of patients according to whether paralysis was absent, slight, moderate or marked at the time of the first injection of serum, being 4, 4.5, 10 and 18 per cent, respectively, or an average of 10 per cent for the 158 patients treated. This is in sharp contrast to the thirteen patients who died (33 per cent) of the thirty-nine control subjects in the same epidemic, and to an average mortality rate of 31 per cent of all cases reported in two states (Kansas and Minnesota) over a period of ten years, 1914 to 1924.

Eight patients, all with suggestive symptoms of poliomyelitis but with negative spinal fluid cell counts, were seen in the epidemic studied by me in the summer of 1928. The fever and the other symptoms in a number of these cases, as in untreated frank cases, were often slow in disappearing, lasting for a week or ten days. After it was found that the concentrated serum had marked beneficial effects and was not accompanied by reaction to the serum in the frank cases of poliomyelitis, it was thought worth while from the standpoint both of relief of suffering and of etiology to try its effects in "abortive" cases. Opportunity presented itself when a boy, aged 13, a patient of Dr. E. A. Olson at Pine Island, Minn., manifested symptoms of the disease ten days after his playfellow of about the same age had manifested identical symptoms. The results of spinal puncture were negative on the second day of illness in both patients. The one who became ill first was not given serum, and the fever and other symptoms lasted for ten days while the patient was in bed. The second patient was given 10 cc. of the concentrated serum, representing 40 cc. of the whole serum, on the second day of the disease. The temperature and pulse rate dropped to normal. The patient felt well, was up and about the following day, and remained well.

The whole serum was given as a prophylactic measure to four family groups at the time when one member of each had contracted the disease, representing twenty-six persons. None of these had either abortive or frank attacks, but nearly all experienced the annoying reaction to the serum a week or ten days later.

TABLE 2.—*Summary of Results in Clinical Cases*

Groups	Cases	Average Duration of Disease at Time of First Serum Treatment, Days	Development of Paralysis After Serum Treatment		Cell Count of Spinal Fluid		Deaths		Recoveries	Incidence and Degree of Residual Paralysis				
			Cases	Per Cent	Cases	Average Count	Number	Per Cent		None	Slight	Moderate	Marked	
													Cases	Per Cent
No paralysis.....	50	1.8	5	10	45	175	2	4	48	47	1	..	..	..
Slight paralysis.....	22	2.8	3	14	13	90	1	4.5	21	19	2	..	..	..
Moderate paralysis..	31	3.2	5	16	12	104	3	10	28	19	9	..	..	..
Marked paralysis....	55	4.1	18	33	22	100	10	18	45	11	8	16	10	22
Total.....	158	3.4	31	20	92	137	16	10	142	96	20	16	10	7
Control cases.....	39	...	..	..	9	110	13	33	26	7	4	5	10	38

RESULTS IN MONKEYS

It must not be supposed that reliance has been made wholly on clinical trial in determining the value of this serum. Numerous tests as to its value under controlled conditions in the treatment of experimental poliomyelitis in monkeys and of its neutralizing power over virus in vitro have been made since the serum was first used in 1917. There have been many failures, but there has been a sufficiently large number of successes to warrant publication at this time. In table 3 are summarized the results of experiments performed along these lines and on the immunization of monkeys with the streptococcus during a period of ten years. The virus was usually injected intracerebrally. Viruses directly from fatal cases and after many passages through monkeys and fresh glycerolated unfiltered and filtered virus were used. The injections of serum were given by several routes, such as intramuscularly, intravenously or intraperitoneally, but, because of the inherent toxicity of horse serum, never intraspinally. Varying amounts were injected, although usually 2 cc. for medium-sized *Macaca rhesus* monkeys was given once or twice daily. The freshly obtained serums, either before or after the preservative had been added (0.2 per cent cresol), were used in most instances in the treatment of the monkeys, as in the neutraliza-

tion experiments in vitro. The serum treatment was begun in some instances on the day of intracerebral injection of virus but usually after one, two or three days had elapsed and in a few experiments paralysis and death were prevented when the serum was first given after the onset of symptoms. It may be noted that the average period of incubation was materially longer (nine and two-tenths days), the incidence of paralysis slightly less (84 per cent) and the mortality rate (38 per cent) much lower in the fifty-five monkeys that received the immune horse serum than in the twenty control monkeys that received the corresponding viruses but were treated with normal horse serum in like manner and dosage. The period of incubation in the latter group was seven and eight-tenths days, the incidence of paralysis 90 per cent and the mortality rate 75 per cent.

In the second part of table 3 are summarized the results of attempts at the neutralization of virus in vitro with immune and normal horse serums and serums from convalescent patients and monkeys. The average period of incubation was longer, and the total incidence of paralysis and the mortality rate were consistently much lower in the forty monkeys that received the virus after it was treated with immune horse serum than in the twenty-one monkeys that received the corresponding virus after it was treated with normal horse serum in exactly the same and usual manner. The average periods of incubation were ten and three-tenths and eight and three-tenths days, the incidence of paralysis was 55 and 85 per cent, and the mortality rates were 22.5 and 67 per cent, respectively. These results with the immune horse serum were approximately as good as those obtained following injection of virus that had been treated before injection with serums from convalescent patients or monkeys. The results with normal serum from man or monkeys were comparable to those with normal horse serum. The period of incubation was about the same, whether the convalescent or the normal serum was used. The incidence of paralysis was 50 and 84 per cent and the mortality rates were 25 and 71 per cent, respectively, in the two groups of experiments. The period of incubation, the incidence of paralysis and the mortality rate in the monkeys receiving virus which had been treated with normal serum from the horse, man or monkey previous to injection were comparable to those in eleven monkeys receiving the same but untreated virus, and to those in seventy monkeys receiving other untreated virus which had been injected for other purposes.

In the third part of table 3 are summarized the results of a large series of experiments in which an attempt was made to find a reliable and practical method for prophylactic vaccination against poliomyelitis with the pleomorphic streptococcus. Various antigens, such as living and heat-killed cultures, filtrates of cultures, and emulsions and filtrates of the brain and cord of rabbits and monkeys that succumbed to inoculation of the streptococcus, and various methods of injection have been used. Thus far a method has not been found that will invariably protect against the drastic method of intracerebral inoculation of virulent virus. Further work is in progress. However, of fifty monkeys that were immunized before they received virus, the average period of incubation in those that manifested symptoms was longer and the incidence of paralysis and the mortality rate were much lower than in the twenty-three unvaccinated control animals that received identical dosage of the same virus. The periods of incubation were eleven, and seven and nine-tenths days, the incidence of paralysis was 60 and 91 per cent, and the mortality rates were 20 and 74 per cent in the two groups, respectively. The immunity in the vaccinated animals when present at all was usually so marked that the animals resisted repeated (as many as seven) intracerebral injections of virulent virus to which the controls succumbed. It was found present as early as fifteen days after the last injection of the immunizing antigen and persisted for as long as one year after immunization. The serum in some of the immune animals neutralized virus in vitro. The detailed report of these experiments will be published shortly.

TABLE 3.—*Summary of Results in Experimental Poliomyelitis in Monkeys*

Groups		Monkeys	Average Period of Incubation, Days	Degree and Incidence of Paralysis, per Cent				Mortality, per Cent
				None	Mild	Marked	Total	
Monkeys treated with	Immune horse serum	55	9.2	16	27	57	84	38
	Normal horse serum	20	7.8	10	25	65	90	75
Monkeys inoculated with virus treated with	Immune horse serum	40	10.3	45	27	28	55	22.5
	Convalescent human and monkey serum	8	8.5	50	25	25	50	25
	Normal horse serum	21	8.3	15	48	37	85	67
	Normal human or monkey serum	7	8.4	16	42	42	84	71
	Controls (untreated virus)	11	7.5	9	27	64	91	64
Monkeys immunized with the pleomorphic streptococcus from poliomyelitis and unvaccinated controls	Vaccinated	50	11.0	40	20	40	60	20
	Controls	23	7.9	9	13	78	91	74
Normal monkeys injected with untreated virus		70	8.2	3	27	70	97	80

SUMMARY AND CONCLUSIONS

The streptococcus having peculiar neurotropic and immunologic properties on isolation has again been cultivated from the throat, brain and cord and for the first time, in pure culture, from the spinal fluid in cases of typical poliomyelitis occurring in another epidemic outbreak. It has been demonstrated consistently in smears of the spinal fluid in twenty-three cases and in each of twelve monkeys that had typical poliomyelitis following inoculation of virus. It was proved to be absent in the spinal fluid of the monkeys before the virus was injected.

The results from the use of poliomyelitis antistreptococcus serum were observed in the treatment of an additional series of patients with epidemic poliomyelitis and of experimental poliomyelitis in monkeys, in neutralization of virus in vitro, and in the immunization of monkeys with the streptococcus against poliomyelitic virus.

The curative action of the serum in the treatment of this new series, as in several previous series of cases

of poliomyelitis, seemed unmistakable and was manifested in one or more of several ways. Annoying symptoms, such as pain, hyperesthesia, headache, fever and high pulse rate, often disappeared promptly. Paralysis seemed to be prevented if given in the preparalytic stage before there was marked evidence of involvement of the spinal cord. Progressive paralysis was seemingly arrested in many cases, including those with beginning bulbar symptoms, and the death rate and incidence of residual paralysis were markedly lowered.

The results obtained from serum treatment are in accord with those reported previously by me, by Rowan,[14] by Sugg,[15] by Clarke and Dow,[16] and by Diveley.[17] The results from the use of poliomyelitis antistreptococcus serum compare favorably with those reported by Aycock and Luther,[18] from the use of convalescent serum. The total mortality rate (10 per cent) in this series of cases, as in those reported previously, is far lower, especially when the serum is given in the early stages of the disease (in which the mortality rate is 4 per cent), than in the control cases occurring in the same epidemics (33 per cent), and is far lower than that which usually occurs in this disease (25 per cent of 224 cases occurring in the state of Minnesota in 1928).

Since the results from the use of this serum in the prevention and treatment of experimental poliomyelitis in monkeys are in agreement with the striking beneficial action again noted in clinical cases, it is concluded that poliomyelitis antistreptococcus serum, when properly prepared, has curative power in poliomyelitis. Its further trial, especially in the concentrated form in which serum reactions are largely eliminated, is indicated.

ABSTRACT OF DISCUSSION

DR. R. L. BENSON, Portland, Ore.: It has been my privilege for some years to follow in a general way the development of this subject. When I was a medical student, from 1906 to 1910, all that we knew of the causal relationship of this disease was the brilliant pioneer work of Flexner of New York. The fact that there was a filtrable virus of some sort was established by him and others, and the work was later carried on by Dr. Rosenow, who recovered a streptococcus. Amos showed me smears of the globoid bodies of the Rockefeller Institute at about that time. Many here have probably seen them also and will realize that the globoid bodies of Flexner and Noguchi were paired organisms, which varied somewhat in shape and size. The contention of Dr. Rosenow was that these were comparable in all respects with the streptococcus which he had isolated. Dr. Rosenow years ago made serologic comparisons of these two organisms, the one which had been obtained in New York and that which he obtained himself. He can correct me if I make any mistake, but I think he found that there was a correlation in the serologic behavior of the two organisms. I feel that an attempt has been made by Dr. Rosenow throughout his work to adhere to the time-honored postulates of Koch. In this work on anterior poliomyelitis, we must recognize that there is difficulty in establishing the causal relationship of this organism, but I hope that Dr. Rosenow is not going to be discouraged.

DR. H. D. BARNARD, Los Angeles: This phase of the treatment is not one with which I come in direct contact in the institution with which I am associated. The orthopedic hospital has been a distributing center for convalescent poliomyelitis serum for approximately three years, during this time providing seventy physicians outside the institution with it and covering a territory including Arizona, Utah and southern California. Eighty patients have received 3,100 cc. of serum. We have sent out questionnaires in an effort to correlate the facts associated with these results. This has proved a difficult task. It has been impossible to assemble the observations of these medical men so that they could be compiled in a record sufficiently accurate to be of any particular value. The difficulties are perfectly obvious. There is no standard on which to judge the amount of residual paralysis, and the effectiveness of the serum was probably in many cases discounted by the lapse of time before the character of the disease was recognized. I believe that there are more unrecognized abortive types of anterior poliomyelitis than there are those which show a severe residual paralysis. One can see how difficult it is in a given case to estimate the effectiveness of the serum. We believe that the majority of cases showing the most brilliant results have been those in which the serum was introduced into the dural canal. Half the men to whom we send this product find it impossible, possibly because of their surroundings or equipment, to introduce it in this manner. Therefore it has been given intravenously and subcutaneously, but we believe that the efficacy of the human serum is greatest when it is administered intradurally. The effectiveness of intravenous and subcutaneous methods is in the order named.

DR. S. H. ASHMUN, Dayton, Ohio: I used this serum in eighteen cases in one epidemic, in 1922, with excellent results in all but two cases. In those two cases the serum was given as early as the second day and yet serious residual paralysis occurred, but in both cases the early outlook was fatal. In the last year I had my first serious reaction from the serum. It is the first time I have ever seen a serious lymphedema result from the intragluteal injection of serum. The lymphedema was certain because there was no heat; there was swelling, without redness, but the buttock became very hard and much swollen. The edema then progressed upward along the anterior abdominal wall muscles. They were thick and hard and rigid over to the midline, and the muscles of the back were also edematous. The right lung was finally involved in that edema. The patient had a high type of infection with sudden and severe onset, with a hemiplegia of the right side, which cleared up. I had given the patient one year previously the toxin-antitoxin of horse serum. I was rather reluctant to give the Rosenow serum on the first day. I waited until the second day, when the temperature seemed to be all right, and then on the third day the dromedary type of temperature was in evidence. I gave the serum on the third day instead of on the first day as I otherwise would have done. The end-result was a residual paralysis, slight in the left leg, and some in the left arm, and the initial hemiplegia was completely cleared up. During the same period I saw two patients in the same house. I believe it was the second day of the disease. The physician in charge had some of the serum, but he said that the state had issued such extensive warnings regarding its injection that he was reluctant to inject it. I advised him to give the serum to both patients, even though it was late and to give a small amount, say 2 cc., to the new-born baby. He refused to do this. The baby did not contract the disease, however, and I should like to have Dr. Rosenow tell me whether in the future he would in similar cases give a baby any prophylactic serum or whether he would try to get the immune human serum.

DR. E. C. ROSENOW, Rochester, Minn.: Regarding the early diagnosis of poliomyelitis, an immediate diagnosis can readily be made during an epidemic of poliomyelitis in any person who has fever and other symptoms suggestive of poliomyelitis through a spinal puncture and a cell count at the bedside. It makes no difference whether the puncture is made as early as six hours after the onset of symptoms, for I have had positive spinal punctures as early as that and in no instance when a spinal puncture was made in the early stages, and found negative, did a child develop paralysis or other symptoms of poliomyelitis subsequently. If the fluid is free from cells, it means that poliomyelitis in the

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16. Clarke, Floyd; and Dow, A. G.: Rosenow's Serum in Prevention of Paralysis in Anterior Poliomyelitis, J. A. M. A. **83**: 421-422 (Aug. 9) 1924.

17. Diveley, R. L.: Anterior Poliomyelitis: A Study of the Acute Stage with Special Reference to the Early Diagnosis and Treatment, J. Bone & Joint Surg. **11**: 100-122 (Jan.) 1929.

18. Aycock, W. L., and Luther, E. H.: Preparalytic Poliomyelitis: Observations in 106 Cases in Which Convalescent Serum was Used, J. A. M. A. **91**: 387-391 (Aug. 11) 1928.

anatomic sense is absent. A carefully made spinal puncture, even in the earliest stages of poliomyelitis and in persons not affected, is harmless and does not predispose to paralysis and, according to many observers, notably Montgomery and Cole, is beneficial. The cells tend to dissolve and if the spinal fluid is sent a great distance with a delay of twenty-four, forty-eight and even seventy-two hours before reaching the laboratory, it may prove negative or the cell count may be lower than it should be. As regards making a puncture, I am through with the ordinary spinal puncture needle with the cutting edge. Dr. H. M. Greene of Portland has devised a noncutting, round-pointed needle which merely separates the fibers of the dura, so that leakage, the chief cause of spinal puncture headache, is prevented following withdrawal of the needle. According to the results obtained last summer the finding of a few gram-staining diplococci in smears of a thoroughly centrifugated sediment of spinal fluid should be considered diagnostic of acute poliomyelitis or encephalitis. The immune horse serum should not be given intraspinally because it is inherently toxic to the meninges and lowers the resistence to the virus; because the virus is rarely found in the spinal fluid, and because for antibodies to reach the anterior horn cells they would need first to be absorbed into the general circulation; hence only intravenous or intramuscular injections should be given. The results from the use of the immune horse serum compare favorably with those reported a year ago to this section and with those reported on the use of convalescent serum in the early stages, and seem of greater value than convalescent serum after paralysis has begun. It is generally believed that convalescent human serum has little or no effect except in the preparalytic stage or as a preventive.

THE SALICYLATES

XIX. THE QUESTION OF ACIDOSIS FOLLOWING THE ADMINISTRATION OF SALICYLATES *

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There has long been an impression that large or clinical toxic doses of the salicylates cause acidosis. The symptoms of "salicylism" have been ascribed to the acidosis, and the use of sodium bicarbonate together with the salicylates has even been justified on this basis, although it is well known that the symptoms are not prevented by the bicarbonate. The use of the bicarbonate for the prevention of gastric irritation has appeared more rational. The considerable number of cases of poisoning by methyl salicylate, accompanied by symptoms of acidosis, reported in the literature,[1] have tended to fortify the supposition that salicylates in general cause acidosis.

In poisoning by methyl salicylate the changes resemble those of diabetic acidosis, as indicated by the presence of acetone in the breath and urine and of decreased alkali reserve of the blood. The use of bicarbonate in the treatment of this acidosis appears rational and seems to be beneficial. Hurtley and Trevan [2] offered a hypothesis which indicated certain chemical and physiologic analogies between products causing phenomena of diabetic coma and salicylic acid. These authors reported that salicylic acid, which may be regarded as an enol acid like diacetic acid and some other products, caused hyperpnea and increased respiratory rate in cats. However, these analogies are too incomplete to indicate that the respiratory stimulation of salicylate belongs to the category of diabetic acidosis.

Symptoms of diabetic acidosis have been reported after very large, and some fatal, doses of sodium salicylate in children.[3] On the other hand, Myers and Ferguson,[4] who have recently made a careful study of possible increases of acetone in the blood of rabbits and a cat receiving toxic or fatal doses of sodium salicylate and of two human subjects receiving "clinical toxic" doses, obtained negative results. Thus, the claims that a diabetic type of acidosis occurs after sodium salicylate lack convincing evidence, but there might still be other types of acidosis, or at least a reduction of alkali reserve, during salicyl medication, especially with the full therapeutic doses used in rheumatic fever.

Owing to the lack of evidence on the latter possibilities in the literature, and because of the considerable interest attached to the salicylates as therapeutic agents, it was resolved to test the question of acidosis experimentally. From the fact that large doses of the salicylates cause hyperpnea in human subjects, especially in children, and also in animals, it was suggested that the respiratory stimulation might be a manifestation of acidosis. Hence, it appeared worthy to attempt correlations of the respiratory changes with those in the blood and urine along lines that would indicate not only whether acidosis occurred but also the nature of it, when present. This, at least, would help to determine whether the clinical suspicions of acidosis were justified, and whether the practice of using bicarbonate with salicylates, with the view of averting systemic acidosis, had a rational basis. Briefly, it was found that several of the salicylates, in doses corresponding to the full therapeutic dosage, caused a definite, though moderate, degree of acidosis, and thus the conjoint use of bicarbonate is justified.

METHODS

Rabbits and cats were used; seven rabbits and seven cats were unanesthetized, and eight cats were anesthetized with urethane (1 Gm. per kilogram by stomach). The respiratory rate was counted, and the minute-volume of expired air measured by means of a Dreser spirometer. All salicyl compounds were given in doses equivalent to 0.2 Gm. of sodium salicylate per kilogram of body weight. The following salicylates were used: sodium salicylate, ammonium salicylate, acetylsalicylic acid and methyl salicylate. Cinchophen was tried in one cat. The use of these different compounds helped to determine the specificity of the salicyl ion. The rabbits and unanesthetized cats received the salicylates gastrically, and the anesthetized cats hypodermically. The hypodermic administrations corrected any irregularities in absorption resulting from the gastric administrations. Control animals were given 50 cc. of water gastrically, or 5 cc. of physiologic solution of sodium chloride hypodermically. Additional controls were made in the individual animals by observing the respiratory rate and minute-volume of expired air during one hour before the salicylates were administered. Blood samples were taken from the femoral artery just before the administration of the drugs and at the end of one and of three hours thereafter, in each animal. Urine was obtained from the rabbits by catheter, and from several of the cats directly from the bladder at the end of the experiment.

* From the Department of Pharmacology, Stanford University School of Medicine.

* Read before the Section on Pharmacology and Therapeutics at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 11, 1929.

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4. Myers, H. B., and Ferguson, C.: J. Pharmacol. & Exper. Therap. **35**: 313, 1929.

The changes in alkali reserve were estimated from the changes in the carbon dioxide combining power of the blood, determined by the method of Van Slyke and Cullen [5] and also by the aeration-colorimetric method of Marriott.[6] The changes in hydrogen ion concentration were estimated colorimetrically by the method of Levy, Marriott and Rowntree.[7] Michaelis' nitrophenol indicators were used instead of phenolsulphonphthalein, in both colorimetric methods. Estimations of blood lactate and blood phosphate were made in nine cats, the lactate being estimated colorimetrically according to the method of Dische and Lazlo,[8] guaiacol being used instead of hydroquinone for the color, and the phosphate, according to the method of Bell and Doisy.[9]

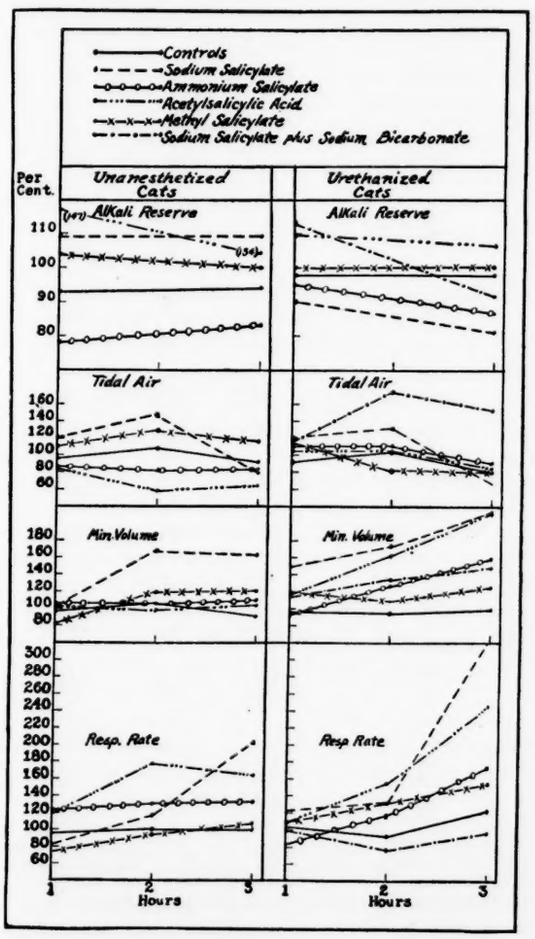

Chart 1.—Effects of various salicylates on respiration and alkali reserve in cats. The curves represent hourly percentage changes in different functions (based on averages) computed from results during the first one hour period of both the controls, or untreated cats, and the cats receiving the salicylates. Since the first one hour periods of the cats receiving salicylates were also control periods, the curves show the changes due to the salicylates in these cats at the end of one, two and three hours after administration.

RESULTS

The extensive data on rabbits and on the two groups of cats receiving the different salicylates have been reduced to the essential results for presentation. In order to smooth out the individual variations, all the data on all functions during each hour were averaged and then tabulated on a percentage basis. That is, the averages of the first hour, or control period, were compared with the averages of each hourly period after the administration of a salicylate. The data on the controls, without salicylate, were treated in the same way. The percentage changes in the respiratory function and alkali reserve (carbon dioxide combining capacity) are presented as curves in chart 1. The average results on these functions and on the p_H and Rp_H of the blood are presented in the accompanying table. Chart 2 shows the results on blood lactate and phosphate and the accompanying respiratory changes in nine urethanized cats receiving sodium salicylate, which were added to the program after acidosis had been demonstrated in the unanesthetized and urethanized cats receiving different salicylates; these results will be discussed after those on the rabbits and on the cats, presented in chart 1, have been considered. The results with rabbits have been omitted as they were extremely variable and of limited usefulness for the purpose at hand, but they may be briefly discussed.

GASTRIC ADMINISTRATION IN RABBITS

The marked variations in all functions in the three control rabbits used prevented an accurate estimate of the importance of changes in the rabbits given salicylates which, too, were variable. On the whole, however, certain tendencies were indicated; the alkali reserve after administration of the salicylates was lower, and hyperpnea was present, though variable, but little or no change occurred in the p_H of the blood. Tests for acetone in the urine, obtained by catheter, were negative in all rabbits. The latter result agreed with the absence of acetone in the blood of rabbits reported by Myers and Ferguson.[4] The tendencies in rabbits were confirmed but more satisfactorily demonstrated in cats, which may be discussed in more detail.

GASTRIC AND HYPODERMIC ADMINISTRATIONS IN CATS

Three untreated cats were used as controls among the seven unanesthetized cats; the results in all were quite uniform and they were averaged for comparison with those of medicated cats of the same group. The curves in chart 1 indicate that the respiratory changes were quite regular throughout and the alkali reserve was only 7 per cent lower at the end of three hours than at the beginning. Of the eight urethanized cats, two were used as controls and the changes were also uniform and therefore averaged; the respiratory rate showed more variation than in the unanesthetized cats, i. e., a slight depression at the end of two hours and an increase of 23 per cent at the end of three hours, but the minute-volume and alkali reserve remained constant. The main difference between the unanesthetized and urethanized control cats was in the minute-volume of respiration; this was smaller in the urethanized cats. Since the rate in these cats was the same as in unanesthetized cats, the tidal air was also smaller. In other words, the ventilation was reduced because the respiration was shallower in the urethanized cats, no doubt from the effects of the anesthetic. The same tendencies in minute-volume and tidal air of the cats given salicylate and receiving urethane existed as in the controls. However, the effects of the salicyl compounds on respiration and blood in the urethanized cats were essentially the same as in the unanesthetized cats. The value of the changes in the unmedicated, control cats was that the changes in cats receiving the salicylates were not accidental. The main effects were on the

5. Van Slyke, D. D., and Cullen, G. E.: J. Biol. Chem. **30**: 289 (June) 1917.
6. Marriott, W. M.: Alkali Reserve of Blood Plasma, Arch. Int. Med. **17**: 840 (June) 1916.
7. Levy, R. L.; Marriott, W. M., and Rowntree, L. G.: A Simple Method for Determining Variations in the Hydrogen Ion Content of the Blood, Arch. Int. Med. **16**: 389 (Sept.) 1915.
8. Dische, Z., and Lazlo, W.: Biochem. Ztschr. **187**: 344, 1927.
9. Bell, R. D., and Doisy, E. F.: J. Biol. Chem. **44**: 55 (Oct.) 1920.

respiration and alkali reserve; these may now be briefly summarized according to each compound, and the essential differences between the compounds, and also between the unanesthetized and urethanized cats, indicated.

RESPIRATION AND ALKALI RESERVE

Sodium Salicylate.—The outstanding result with this compound was a marked increase in pulmonary ventilation, in both the urethanized and the unanesthetized cats. In the urethanized cats there was a marked increase in respiratory rate, which amounted to 220 per cent, and the minute-volume was also markedly increased, but the increase did not keep pace with the slowest. The alkali reserve was increased 13 per cent at the end of the first hour but fell steadily and was 8 per cent below the control at the end of the three hours. Thus there was a reduction in alkali reserve despite the addition of the bicarbonate. The effect was the same as in the cats receiving sodium salicylate alone. These results suggested that sodium salicylate caused respiratory stimulation and this in turn decreased the alkali reserve.

Ammonium Salicylate.—Theoretically, this salicylate should cause acidosis, because the ammonium ion is changed to urea and the salicyl anion is set free. However, the changes were not significant. In the

*Respiratory and Blood Changes in Cats Receiving Different Salicylates and Cinchophen**

Unanesthetized Cats							Urethanized						
Consecutive Hourly Periods	Respiratory Rate	Minute-Volume, Cc.	Tidal Air, Cc.	Carbon Dioxide Combining Capacity, per Cent by Volume	p_H	Rp_H	Consecutive Hourly Periods	Respiratory Rate	Minute-Volume, Cc.	Tidal Air, Cc.	Carbon Dioxide Combining Capacity, per Cent by Volume	p_H	Rp_H
Controls (without medication)													
F. P.†	46	1038	23.3	58.8	7.15	8.25	F. P.	47	657	13.9	51.4	7.15	8.00
1	45	1005	22.3	54.3	7.15	8.25	1	49	630	12.9	53.5	7.15	7.95
2	46	1157	25.1	....	....	....	2	43	617	14.3	....	....	....
3	46	979	21.4	54.7	7.15	8.20	3	58	645	11.1	50.0	7.15	7.95
Sodium Salicylate													
F. P.	34	1296	38.0	53.8	7.10	7.75	F. P.	30	624	20.8	50.0	7.10	7.80
1	29	1328	45.7	58.6	7.10	7.80	1	37	935	25.2	45.3	7.10	7.82
2	39	2153	55.3	....	....	....	2	39	1075	27.5	....	....	....
3	69	2090	30.2	58.6	7.10	7.80	3	96	1330	13.9	40.4	7.10	7.80
Ammonium Salicylate													
F. P.	34	1915	56.3	60.5	7.20	8.05	F. P.	37	542	14.7	42.4	7.15	7.95
1	42	2025	48.2	47.1	7.20	8.00	1	31	505	16.3	40.4	7.15	7.90
2	44	2010	45.7	....	....	....	2	42	685	16.3	....	....	....
3	45	2107	46.9	50.0	7.05	7.95	3	64	857	13.4	36.6	7.15	7.80
Acetylsalicylic Acid													
F. P.	44	1862	42.4	47.1	7.10	8.00	F. P.	32	598	18.7	39.4	7.20	8.00
1	53	1875	35.4	69.1	7.20	8.40	1	35	690	19.7	43.3	7.20	8.00
2	78	1855	23.8	....	....	....	2	49	962	19.6	....	....	....
3	72	1923	26.8	63.1	7.25	8.20	3	79	1260	15.9	42.4	7.20	7.95
Methyl Salicylate													
F. P.	28	872	31.2	48.1	7.00	7.65	F. P.	29	484	16.6	46.2	7.15	8.05
1	21	723	34.4	50.0	7.00	7.80	1	32	570	17.8	46.2	7.15	8.05
2	26	1040	40.0	....	....	....	2	38	523	13.8	....	....	....
3	29	1055	36.3	48.1	7.00	7.80	3	45	602	13.4	46.2	7.15	8.05
Sodium Salicylate and Sodium Bicarbonate													
							F. P.	60	840	14.0	44.7	7.10	8.15
							1	59	958	16.2	50.4	7.10	8.27
							2	46	1120	24.3	....	....	....
							3	58	1240	21.3	40.9	7.10	7.95
Cinchophen Sodium													
							F. P.	23	392	17.0	45.3	7.15	8.00
							1	22	457	20.7	45.3	7.15	8.09
							2	26	530	20.7	....	....	....
							3	26	512	19.7	45.3	7.15	8.00

* Data represent averages as described in the text; those of anesthetized controls were obtained from three cats, and of urethanized controls from two cats. The data on the salicylates and cinchophen are from individual cats.

† F. P. indicates foreperiod of one hour; in cats receiving the salicylates and cinchophen, before these drugs were administered.

increase in rate and at the end of the three hours the tidal air was only 68 per cent of the control period. In the unanesthetized cats the rate was increased 100 per cent and the minute-volume 68 per cent at the end of three hours.

After sodium salicylate in the unanesthetized cats, the alkali reserve remained 9 per cent higher than in the control period, while in the urethanized cats there was a decrease of 10 per cent at the end of the first hour and of 19 per cent at the end of the third hour.

Sodium Salicylate and Bicarbonate.—Equal doses of these two salts, in one urethanized cat, caused a marked increase in pulmonary ventilation. The rate was decreased 20 per cent at the end of two hours and then reached the control rate at the end of three hours, while the minute-volume increased steadily throughout and amounted to a maximum increase of 72 per cent at the end of two hours, when the respiration was

urethanized cats, the respiratory rate was increased 72 per cent and the minute-volume 60 per cent; therefore there was an increase in pulmonary ventilation. On the other hand, in the unanesthetized cats the rate was increased only 20 per cent and the minute-volume remained constant, resulting in a decrease of tidal air, and thus the effect on ventilation was practically nothing, or a decrease. The alkali reserve was decreased 5 per cent at the end of one hour and 8 per cent at the end of three hours in the urethanized cats, and in the unanesthetized cats it decreased 22 per cent at the end of one hour and then recovered to 17 per cent below the control at the end of three hours.

Acetylsalicylic Acid.—This compound was administered as the sodium salt, which was prepared by the addition of just the necessary amount of sodium hydroxide. A marked stimulation of respiration and increase in ventilation occurred in both the unanes-

thetized and the urethanized cats, but the changes were not equal, probably because the former received the drug by stomach and the latter hypodermically. In the unanesthetized cats the respiratory rate increased 78 per cent at the end of two hours and 64 per cent at the end of three hours; the minute-volume remained nearly constant and therefore the tidal air was decreased. In the urethanized cats the rate increased progressively until it reached 148 per cent at the end of three hours, and, since the minute-volume kept pace with the increase in rate, the tidal air remained nearly constant. In these cats the alkali reserve was increased 10 per cent at the end of one hour and 6 per cent at the end of three hours, while in the unanesthetized cats the increase was 47 per cent at the end of one hour and 34 per cent at the end of three hours. Hence, in both groups of cats the alkali reserve progressively decreased, although it was at all times above that in the controls, possibly as a result of the use of alkali with the drug. The alkali, however, was in stoichiometeric proportions and should not have affected the alkali reserve any differently than the sodium salicylate. Nevertheless, the stimulated respiration succeeded in reducing the bicarbonate of the alkali reserve, just as was the case with the other salicylates.

Methyl Salicylate.—The respiration and alkali reserve of unanesthetized cats receiving the ester gastrically were not demonstrably affected, although tests for salicyl in the urine were positive, indicating some absorption at least. The respiratory rate of the urethanized cats receiving the ester hypodermically increased steadily up to 53 per cent at the end of three hours; but the minute-volume was increased only 20 per cent and did not keep pace with the rate, and thus the tidal air was decreased. The alkali reserve was unaffected. The results with methyl salicylate in both groups of cats fell within the range of those with the control or untreated cats, all of which testifies to the comparative systemic inefficiency of this compound, in the dosage used. Any small increases in respiration shortly after administration were probably of reflex origin.

Cinchophen Sodium.—A single experiment on a urethanized cat was made with this compound because it is closely related pharmacologically and therapeutically to the salicylates, and the results would indicate whether the respiratory stimulation and decrease of alkali reserve described were peculiar to the salicylates. The dose used was 0.2 Gm. per kilogram hypodermically, the same as that of sodium salicylate. The results were not included in chart 1 because there were no important effects on respiration and no changes in alkali reserve. The very slight increases in respiratory rate and minute-volume came within the range of controls and of experimental error. Consequently, the results of this single experiment indicate peculiar powers of the salicylates to stimulate respiration and decrease the alkali reserve.

Other changes in blood, besides those in alkali reserve according to the carbon dioxide combining capacity already described, may now be summarized.

OTHER BLOOD CHANGES

p_H.—This remained practically constant throughout, after all the salicylates and cinchophen in all the cats of both groups. The only cat which showed a possibly significant increase (from 7.1 to 7.2) was the unanesthetized cat that received acetylsalicylate, and the only one showing a decrease (from 7.2 to 7.05) was the unanesthetized cat receiving ammonium salicylate. These changes, however, may have been due to errors in technic. From the fact that the alkali reserve was generally decreased and the p_H normal, or unchanged, in the vast majority of cats receiving the salicylates, it was indicated that there was a fixed acid acidosis, compensated by increased loss of carbon dioxide.

Rp_H.—This value, which indicates changes in alkali reserve by aeration and colorimetry of the plasma after the p_H has been obtained, generally followed the changes in alkali reserve, estimated according to the carbon dioxide combining capacity and already discussed; therefore, the changes in the latter were corroborated. Occasionally the alkali reserve, according to the Rp_H, remained at a higher level when that according to the carbon dioxide combining capacity was decreased. The exact significance of this lack of agreement was not understood; however, the estimation of the Rp_H is not without its technical difficulties.

Blood Volume.—Repeated withdrawal of blood (hemorrhage) is known to result in dilution which would tend to vitiate the results of the blood analysis. However, the total quantities withdrawn in my experiments represented not more than 5 per cent of the total blood volume, and actual estimations of the specific gravity in three urethanized cats, according to the falling drop method of Barbour and Hamilton,[10] did not show any demonstrable changes. Therefore the changes in alkali reserve, according to both the carbon dioxide combining capacity and the Rp_H, were not due to changes in blood volume, either by dilution or by concentration, but to actions of the salicylates.

Blood Pressure.—Although it is well known that the normal or healthy circulation is not importantly affected by the salicylates, except in very large and toxic doses which tend to depress it, the blood pressure was measured during a period of three hours in a urethanized cat receiving the usual dose of 0.2 Gm. of sodium salicylate. The blood pressure remained unchanged throughout, except for sudden, but fleeting, decreases during the withdrawal of blood samples; the cat showed the usual respiratory stimulation and a decrease of 9 per cent in alkali reserve. Thus the results corroborated the well known and comparative innocuousness of salicylates, in therapeutic doses, on the healthy circulation, and indicated that the respiratory stimulation and decrease in alkali reserve of the cats receiving salicylates were not due to circulatory depression, or at least not to a decrease in blood pressure, which is known to result in respiratory stimulation.

COMMENT

Collectively, the results obtained demonstrate a definite and generally marked respiratory stimulation, and a moderate lowering of the alkali reserve by the readily absorbable salicylates, in doses corresponding to the full therapeutic dosage. These changes occur directly from the salicyl ion and not indirectly from changes in functions which might affect respiration or alkali reserve. The question of whether acidosis results from the salicylates can therefore be answered in the affirmative. This satisfied the object of my inquiry. The exact mechanism of the acidotic action of the salicylates was not determined, but certain indications regarding the nature of the acidosis appeared obvious.

10. Barbour, H. G., and Hamilton, W. F.: J. Biol. Chem. **69**: 625 (Aug.) 1926.

The respiratory stimulation could not have been due to carbon dioxide of asphyxial origin because the blood carbonate was decreased, or to lowering of the p_H of the blood because this was generally unchanged. It could have resulted from a direct action of the salicylates on the respiratory center, or from products elaborated from the metabolic action of these drugs. One result of respiratory stimulation would be an increase in pulmonary excretion of carbon dioxide with a resulting alkalosis and finally apnea, such as follows forced respiration. However, apnea did not occur but, on the contrary, the respiration remained stimulated as the alkali reserve decreased progressively. The urinary titrations, so far as made in rabbits, tended to show an increase in excretion of acid salts, if anything, but the results were too unsatisfactory to be of value. Therefore, the liberation or accumulation of fixed acid may be assumed, and this could account for the reduced alkali reserve and respiratory stimulation, the latter being caused directly or as the result of freed carbon dioxide from the bicarbonate of the alkali reserve. Thus, there would be a fixed acid acidosis, compensated by loss of carbon dioxide. The nature and origin of the fixed acids was suggested from known actions of salicylate.

It is known that anoxemia, or deficient oxidation in the tissues, increases the lactic acid of the blood, and some impairment of oxidative processes presumably occurs in the catabolic action of salicylates.[11] The salicylates are known to increase nitrogenous metabolism and to cause phosphaturia;[12] also to retard fermentative (oxidase) processes.[11] Moreover, blood lactic acid is increased after the intravenous injection of large and toxic doses (from 0.4 to 0.98 Gm. per kilogram) of sodium salicylate in dogs.[13] With these possibilities in mind, attempts were made to estimate the changes in the blood lactate and blood phosphate of eight urethanized cats receiving sodium salicylate in the same dosage (0.2 Gm. per kilogram hypodermically) and under the same conditions as those of chart 1.

The results, which are presented graphically in chart 2, show that the one half, or four, of the eight cats which showed a 30 per cent increase, or more, in respiratory rate showed also definite though variable increases in lactate, and three of the cats showed decreases in alkali reserve. Four cats showed less than 30 per cent increases, or decreases, in respiration and no changes in lactate, and either no changes or some increases in alkali reserve. All of the eight cats showed increases in phosphate. The control cat, without salicylate, showed a slowing of respiration, increase in alkali reserve and phosphate and no change in lactate. Thus, there seemed to be a correlation between the increase in fixed acid (lactate, but not phosphate) and decrease of alkali reserve in the cats showing significant respiratory stimulation. The mechanism of the increases in the fixed acid was not studied; nor was it determined whether the increased phosphate consisted of alkaline or acid phosphate. Since an increase in phosphate occurred in the control, urethanized cat, the increase may have been due to the anesthetic. Assuming that a part at least of the fixed acid was lactic acid, the decreased alkali reserve and respiratory stimulation could be accounted for. Lactic acid would cause certain complications which would make the whole process of acidosis less smooth than if the fixed acid was phosphoric. That is, the lactic acid would be partly oxidized to carbonate and thus tend to maintain the alkali reserve, which partly, at least, would consist of lactate; a part would undergo conversion to glycogen and thus disappear, and part would be excreted. These peculiarities of lactic acid might explain the variations in the changes accompanying the acidosis of the salicylates.

A factor entering into the acidotic action of salicylates is the impairment of renal functional efficiency. The latter has been demonstrated in animals receiving doses of the magnitude used in my experiments, and in man receiving full therapeutic doses.[11] This would tend to cause retention of fixed acids ordinarily eliminated by the kidney. Thus, the increases in blood

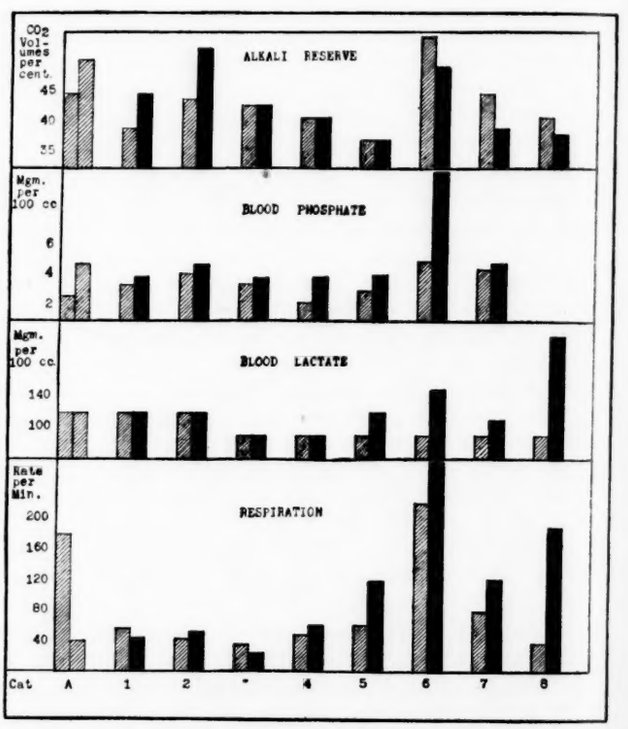

Chart 2.—Changes in blood lactate and phosphate, respiration and alkali reserve (carbon dioxide combining capacity of blood) in eight urethanized cats receiving sodium salicylate (0.2 Gm. per kilogram hypodermically). The cross-hatched rectangles among the cats receiving salicylate denote control values before the salicylate, and the solid block, changes at the end of three hours after salicylate. Cat A was a control without salicylate, the results indicated being the controls during the first hour and at the end of three hours. Cats 2 and 5 received 1.25 Gm. of urethane per kilogram, while the remaining cats received 1 Gm. per kilogram.

lactate and possibly also in blood phosphate might be accounted for; these increases might be mere accumulations of the normal acids, or those of increased catabolism, or both. Without further evidence, this phase of the question of acidosis after salicylates must be left open. The diabetic type of acidosis can be ruled out because acetone and diacetic acid have not been demonstrated after the salicylates in full therapeutic doses and even after toxic doses, but these constituents do occur in the fatal poisoning from very large doses of methyl salicylate in man.

From the clinical standpoint, the demonstrated occurrence of a moderate degree of acidosis in salicylate medication provides a rational basis for prescribing sodium bicarbonate together with the salicylate.

11. Hanzlik, P. J.: Actions and Uses of the Salicylates and Cinchophen in Medicine, Baltimore, Williams & Wilkins, 1927.
12. Denis, W., and Means, J. H.: J. Pharmacol. & Exper. Therap. **8**: 273 (June) 1916.
13. Hanzlik, P. J.; De Eds, F., and Tainter, M. L.: Blood and Symptomatic Changes Following Intravenous Administration of Variety of Agents and Solutions, Arch. Int. Med. **36**: 447 (Oct.) 1925.

The reduction in alkali reserve after doses the equivalent of full therapeutic doses used in this study was about 10 per cent. Assuming a total 200 Gm. of bicarbonate in an adult's body,[14] there would be a loss of about 20 Gm. as the result of acidosis accompanying the administration of full therapeutic doses, i. e., about 10 or 12 Gm., of sodium salicylate in rheumatic fever. Since the bicarbonate and salicylate are usually prescribed in equal total doses of 10 or 12 Gm. each, it is seen that about one-half the lost bicarbonate of alkali reserve is replaced in current practice. Apparently, it would be better to prescribe bicarbonate in twice the dosage of the salicylates. In severe salicyl poisoning, from any salicyl compound, symptoms of acidosis may always be expected and the use of bicarbonate in treatment is therefore rationally indicated. There is finally the justification of using bicarbonate together with salicylate, and also cinchophen, to avoid local gastric irritation by the free or liberated acid. These various considerations do not enter into the use of single small doses as of acetylsalicylic acid in headache and other minor complaints.

CONCLUSIONS

1. The readily absorbable salicylates, namely, the sodium and ammonium salicylates and acetylsalicylic acid, in doses equivalent to the full therapeutic dose, administered gastrically and hypodermically, caused a definite and generally marked respiratory stimulation with depletion of the alkali reserve of the blood in rabbits and cats. The p_H (hydrogen ion concentration) remained unchanged, and acetone in the urine was not demonstrable.

2. These changes were best reconciled as the equivalent of a fixed acid acidosis, compensated by loss of carbon dioxide. Definite increases in blood lactate were correlated with significant decreases in alkali reserve and respiratory stimulation in one half, or four, of eight cats receiving sodium salicylate in doses equivalent to the full therapeutic; the remaining four cats did not show evidences of acidosis, but in view of the respiratory and blood changes that occurred, there was still a correlation between these functions. Various possibilities regarding the origin of the increases in the fixed acid occurring in salicyl medication are indicated, but this phase of the question requires further investigation.

3. Consequently, the use of bicarbonate together with salicylates in full therapeutic doses in rheumatic fever and also in the treatment of salicyl poisoning is rational on experimental grounds at least.

4. No demonstrable effects were produced by methyl salicylate, because it is not readily absorbed, and by cinchophen, thus pointing to a peculiarity of the salicylates in causing acidosis.

ABSTRACT OF DISCUSSION

DR. H. B. MYERS, Portland, Ore.: The question of toxicity from salicylates is one that is bound to interest us considerably, if for no other reason than the extensive use of salicylates in therapeutics. The reputed cardiac toxicity of salicylates has been discredited by animal experimentation, by failure of support from clinical statistics, and by the work of Mendenhall, Camp, Masters and others, who have definitely refuted the claim of cardiac toxicity. The dosage of salicylate is now rather firmly established as one of two separate considerations, the dosage of a relatively small quantity to relieve sensibility to pain, and the so-called full therapeutic dosage employed in acute arthritis. With the latter dosage the toxic symptoms of cinchonism may develop, which are the symptoms referred to when one speaks of the toxic dosage. The real important and essential toxicity of salicylates is that presented by Dr. Johnson; namely, the acidosis resulting from the use of these large doses of salicylates. Ferguson and I have recently reported on a study of the blood content of acetone, diacetic acid, and beta-oxybutyric acid in animals given large toxic doses or fatal doses of sodium salicylate. Symptoms of air hunger were produced corresponding with those occurring in patients with salicyl acidosis. Yet we failed to find any important deviation from normal of the blood content of the acetone bodies. We were led to study the acetone content of the blood because of the statement of those reporting on salicyl acidosis that it resembled strikingly the acidosis of diabetic coma. It is pleasing to have the results of Dr. Johnson in indicating a probable cause of the acidosis, following salicyl therapy, and giving us a basis now for employing bicarbonate along with the salicylate.

DR. P. J. HANZLIK, San Francisco: This work of Dr. Johnson's leaves no doubt that there is an acidosis accompanying the administration of large or full therapeutic doses of the salicylates. The puzzling thing is the cause of the increase in lactic acid. We are accustomed to thinking of increases in this acid in terms of muscular exercise, but I believe that increases in lactate occur under a variety of conditions. It has been recently shown that local anesthetics can cause an increase in the lactic acid content of muscle, and in the salicylates we have a group of drugs that cause a certain amount of central depression. It would appear then that local anesthetics and analgesics possess this acidotic action in common. One factor in the systemic acidosis of salicyl that must be borne in mind is that the salicylates decrease renal functional efficiency; this in itself would be enough to account for the increases in blood lactate and phosphate. As Dr. Johnson stated, this phase requires investigation. However, there is no doubt of the increase in blood acids, whether this occurs directly or indirectly, and of their intimate connection with respiratory phenomena. Another thing to be investigated is the methyl salicylate which physicians are still using considerably. This salicylate does not cause lactic acidosis, because it is poorly and irregularly absorbed from the alimentary tract. This is apt to result in overdosage and toxicity, other than the ordinary salicyl action. One manifestation of the toxicity is the diabetic type of acidosis. In the local use of methyl salicylate, the dermal absorption is so poor that the typical systemic action of salicyl is not obtained. The effect is mainly that of counterirritation.

DR. CHARLES C. JOHNSON, San Francisco: There is not much to add, except to emphasize the finding of a moderate degree of acidosis after salicyl and full therapeutic doses, and the use of bicarbonate in the intensive salicyl treatment of traumatic fever to avert the possible acidosis that occurs.

14. Sellards, A. W.: The Principles of Acidosis and Clinical Methods for Its Study, Cambridge, Harvard University Press, 1917.

Arrhythmia in Hypothalamus.—Experiments showed that in the decerebrated animal adrenalin is the only way to cause an arrhythmia of the heart. If the stellate ganglion is paralyzed by nicotine, the heart beat is normal. Now, if the adrenals are extirpated and the posterior roots of the spinal nerves going to the heart are cut, the arrhythmia is accentuated. If the anterior roots are then cut, the arrhythmia disappears, showing that there are no afferent impulses from the heart to the spinal cord. Death from chloroform anesthesia is thus thought to be due to the increase in adrenalin in the circulation which throws the ventricle into fibrillation. If all the spinal roots are cut except the anterior root of the second thoracic nerve, the heart beat remains relatively normal; when that is cut the control of the higher centers is gone and ventricular fibrillation results. If the cat's brain is sectioned, no effect is noted on the adrenalin secretion until the hypothalamus is cut; then the arrhythmia disappears, showing the control of the hypothalamus on reflex adrenalin secretion. Stab wounds as well as electrical stimulation of the hypothalamus stopped or started the arrhythmia. If the degenerating nerve fibers were followed it was found that projection fibers of the hypothalamus passed not only down the cord but to part of the brain with sympathetic connections.—Beattie, John: Hypothalamus and Its Relation to the Sympathetic Nervous System, *New England J. Med.*, February 13, p. 353.

CLINICAL OBSERVATIONS ON PHENYLAMINOETHANOL SULPHATE *

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In an effort to further our knowledge of the relationship between the chemical constitution and physiologic action of compounds related to epinephrine and ephedrine, as well as to establish the possible therapeutic uses of phenylaminoethanol sulphate we have continued our investigation of this substance.

The first report on the clinical study of this substance from our laboratory [1] showed that its local application in the nose caused marked shrinking and paling of the mucous membrane without the irritation so frequently found when epinephrine is used. The duration and intensity of the local effect were in every way comparable to that of ephedrine. Phenylaminoethanol sulphate differs from ephedrine, however, in that it appears to be without useful therapeutic effect on the bronchi when injected subcutaneously or when taken orally.

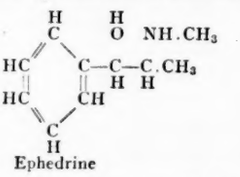
Topical application in the nose for the shrinking of swollen membranes thus appeared to be a clinically useful effect of phenylaminoethynol sulphate. Tainter [2] has recently studied the antiedemic action of epinephrine, tyramine hydrochloride, ephedrine, phenylaminoethanol sulphate and pituitary extract on experimental systemic and local edemas. Phenylaminoethanol sulphate and pituitary extract had an effect on certain types of edema, while ephedrine and tyramine hydrochloride were without any appreciable effect. Chen [3] has recently reported in abstract form the results of a study of many homologues and isomers of ephedrine and states that the majority of the compounds studied contract the congested nasal mucosa in man. Phenylaminoethanol sulphate is the simplest homologue of ephedrine having low toxicity and therefore deserves extended clinical study in this application.

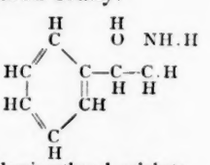
The Council on Pharmacy and Chemistry of the American Medical Association has published a preliminary report on the product.[4] This compound has been further studied by Tainter [5] in a more complete manner with particular reference to the mechanism of its pharmacologic actions. The mechanism of its actions seems to be closely related to that of tyramine hydrochloride and ephedrine and differs considerably from that of epinephrine. He concludes that the main therapeutic possibilities would be local applications in the nose for shrinkage of congested mucosa and turbinates and on the eye as a mydriatic. A few preliminary observations on the mydriatic effect of this drug were reported by us,[1] but we have not made any further observations of this effect.

Since the time of our last report we have used a 2 per cent phenylaminoethanol sulphate solution as a routine on a few hundred patients to relieve the coryza and nasal obstruction of hay-fever. The solution was administered by spray, applicators or nasal packs and, regardless of the method of administration, was found to produce marked shrinking and paling of the irritated membranes. The relief is rapid and but rarely attended by any irritation, which is so common when epinephrine is used for the same purpose. The duration of the effect is variable, usually lasting about two hours, but is prolonged many hours in some cases.

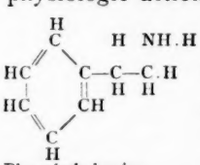
We have administered 1 cc. of a 5 per cent solution or 50 mg. subcutaneously to a few patients with urticaria. The effect was to produce partial and evanescent relief from itching without remarkable modification of the lesions. As compared with epinephrine, with which relief from itching is marked although not prolonged, the drug is of but little value.

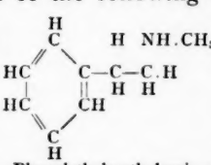
The absence of physiologic activity when phenylaminoethanol sulphate is administered orally is of interest from the standpoint of chemical constitution and physiologic action. This substance differs in chemical structure from ephedrine only in that it contains two less methyl groups and it therefore seems that the presence of one or both of these methyl groups in the molecule may be causally related to the effectiveness of ephedrine when administered orally.

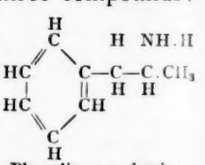

Ephedrine


Phenylaminoethanol sulphate

To test this hypothesis we have investigated the physiologic action of the following three compounds:


Phenylethylamine


Phenylethylmethylamine


Phenylisopropylamine

This particular set of compounds was chosen to avoid the question of differing physiologic effect of optical isomers, which would have to be considered in the case of the hydroxyl compounds related to ephedrine and phenylaminoethanol sulphate.

Preliminary experiments with these compounds, injected intravenously into dogs, showed that the first two had a marked but not prolonged effect on the blood pressure, while the third compound caused a marked rise in pressure which lasted several hours. We then investigated these compounds in man, using 50 mg. of the hydrochlorides of these bases injected subcutaneously or taken by mouth.

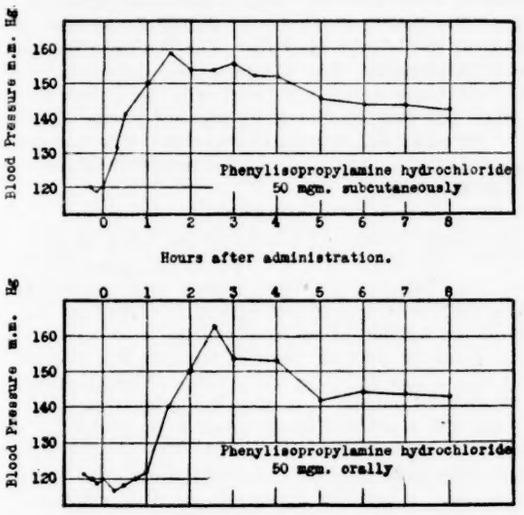
One cubic centimeter of a 5 per cent solution of phenylethylamine hydrochloride and phenylethylmethylamine hydrochloride injected subcutaneously did not cause any appreciable change in blood pressure or heart rate over a period of three hours. Likewise, when taken by mouth they did not have any demonstrable effect. On the other hand, when 1 cc. of a 5 per cent solution of phenylisopropylamine hydrochloride was injected subcutaneously there was a marked rise in blood pressure, which lasted over eight hours. Coincident with the high pressure there was a drying of the mouth and nose because of a suppression of the secretions. Identical effects were obtained on oral administration except that the time of onset of the effects was delayed about one hour when the drug was

* Read before the Section on Pharmacology and Therapeutics at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 12, 1929.

1. Miller, Hyman; and Piness, George: A Synthetic Substitute for Ephedrine, J. A. M. A. **91**: 1033 (Oct. 6) 1928.
2. Tainter, M. L.: J. Pharmacol. & Exper. Therap. **33**: 129 (June) 1928.
3. Chen, K. K.; Wu, C. K., and Henriksen, E.: Proc. Soc. Exper. Biol. & Med. **26**: 348 (Jan.) 1929.
4. Phenylaminoethanol Sulphate, J. A. M. A. **91**: 1037 (Oct. 6) 1928. J. Am. Pharm. A. **17**: 1195, 1928.
5. Tainter, M. L.: J. Pharmacol. & Exper. Therap. **36**: 29, 1929.

taken shortly after a meal or about thirty minutes when taken on an empty stomach. The pressure changes are shown in the accompanying charts.

It would seem that the methyl group on the side chain of ephedrine is the part of the structure particularly responsible for its duration of action and effectiveness when administered orally and that the absence of



Pressure changes.

such a methyl group on the side chain explains its relative inactivity when administered subcutaneously or orally. The methyl group on the side chain apparently renders the compounds less susceptible to destruction in the body.

We are carrying out further studies with phenylisopropylamine and hope to extend our studies to closely related compounds.

1136 West Sixth Street.

ABSTRACT OF DISCUSSION

DR. M. L. TAINTER, San Francisco: I had the opportunity of studying phenylaminoethanol sulphate shortly after it was introduced by Dr. Piness. I found that it stimulated the circulation, mainly through an action on the heart. By means of cocaine and ergot it was shown that these effects were not due to stimulation of sympathetic nerve endings but were probably muscular in origin. Phenylaminoethanol sulphate raised the blood pressure as effectively as any of the compounds of this series, and had a fairly prolonged pressor action. It is most effective when injected intravenously, with little effect subcutaneously, and none orally. I myself have taken 1.5 Gm. by mouth with no change in the blood pressure, pulse rate or symptoms. The lack of effect by mouth is the main disadvantage of this compound. Excised uterine muscle is stimulated directly and the pupils are dilated. These compounds possess a number of valuable therapeutic effects. They dilate the pupils, shrink congested nasal mucosa, relax bronchial spasm, and also produce important stimulations of blood pressure and circulation. But not all the compounds have these actions to similar degrees. It seems probable, therefore, that by intensive analytic studies, such as have been begun by Dr. Piness and several others, we may be able to select those which combine most advantageously these desirable therapeutic qualities, and which will, in addition, be effective when given orally. Whether or not we can develop such a truly ideal compound remains to be seen. There is no doubt that the studies already in progress will give rise to compounds having definite advantages in certain directions over epinephrine and ephedrine.

DR. GORDON ALLES, Los Angeles: I am the chemist with Dr. Piness and am particularly interested in this work. The compounds described have an interest from a chemical standpoint aside from their therapeutic qualities. Many years ago, physiologic studies of the action of this series of compounds were made by Barger and Dale, and after studying a large number of compounds they came to certain conclusions with regard to chemical structure and physiologic action. Present-day studies, largely as a result of the work carried on at Stanford University School of Medicine by Dr. Tainter and Dr. Hanzlik, indicate that the action of these compounds is more complicated than was previously suspected. However, by further study of a large variety of these compounds, it seems possible that we may consider that we know something of the relation between chemical constitution and physiologic action in this series of compounds. Our past and our future thoughts will differ in that our future ideas will be more complicated by the variety of combinations that enter in, but will enable us in the course of time to relate a physiologic action to a definite chemical structure.

DR. N. M. KEITH, Rochester, Minn.: One interesting chemical reaction of phenylaminoethanol sulphate is that the rising blood pressure apparently does produce some uncomfortable effects. I should like to see the pharmacologists and chemists make a compound which does not cause the blood pressure to rise, and yet helps in bronchitis and in hay-fever.

DR. GEORGE PINESS, Los Angeles: I wish Dr. Keith's suggestion were possible, giving both relief of the bronchus spasm and at the same time keeping blood pressure down, but we find the blood pressure raised in those who are relieved without having it raised, so I think that perhaps the drug, if it does continue to give the rise in blood pressure plus the relief in bronchus spasm, may have a great deal of value. There were two objectives in this study. One was to produce a substance that cost less than ephedrine, which is too high for the ordinary individual, and the other was to produce a substance that would have a prolonged effect and at the same time avoid the unusual toxic effect which goes with the ephedrine. The ephedrine gives the desired relief both by mouth and by local application, but subcutaneously is not as effective. We hope that this preparation eventually, when it is completed, will have the effect of oral administration, local application and subcutaneous injection.

Clinical Notes, Suggestions and New Instruments

GONORRHEAL TONSILLITIS *

H. E. FOSTER, M.D., SHERIDAN, WYO.

An extensive search of the literature on the subject of gonorrhea fails to disclose any reports of a tonsillitis caused by Neisser's diplococcus. While undoubtedly cases have been observed and possibly a report or two made, the condition is not common. Therefore the case presented here is deemed worthy of reporting.

REPORT OF CASE

The patient was admitted to the hospital in the spring of 1929 with a diagnosis of manic-depressive psychosis, in the depressed phase. His mental condition was such that he was placed in a parole ward soon after the period of observation was terminated. The patients in full parole wards are occasionally granted city passes, and while on a visit in the city one afternoon this patient was unfortunate enough to become infected with the neisserian diplococcus. He was isolated in a closed ward, June 21, 1929. Treatment was instituted consisting of a bland diet, rest, methenamine, forced liquids, and injections of mild silver protein. Soon after the infection developed he became more depressed and did not cooperate fully at all times, so that the urethral discharge was unduly prolonged, continuing to the latter part of July, 1929, when he was allowed the full privileges of the closed ward and transfer to another ward was being carefully considered. However, an occasional morning drop was observed and, although all urethral smears were reported negative, it seemed best to retain him under very close supervision.

* From U. S. Veterans' Bureau Hospital number 86.

On the night of August 8, the patient complained of "pain in the heart" and was examined by the officer of the day, who failed to detect any heart lesion. Nor could the ward surgeon (the writer) find any lesion the following day. The complete rest and light diet prescribed by the officer of the day was observed by the patient for two days after which he again resumed his restricted exercise around the ward. After August 9 there was a period of two weeks in which he was very uncooperative. At 6 p. m. on the 27th he complained of a sore throat, and a gargle was prescribed. The following morning when in charge of the ward I had a smear and culture made of the throat, which is a routine procedure in such cases at all U. S. Veterans' Bureau hospitals. However, the patch on the left tonsil was very different from the usual tonsillitis or diphtheritic growth. It was almost perfectly circular, about 12 mm. in diameter, and appeared to be raised evenly throughout with the edges sharply defined and precipitous. It was very tenacious, like the diphtheritic patch. The laboratory reported that a Gram stained smear of purulent matter from the left tonsillar area showed an abundance of pus cells with an abundance of intracellular and extracellular gram-negative biscuit-shaped diplococci resembling the gonococcus in size, form, grouping and staining properties. There were a few Vincent's angina bacilli and no spirilla present. A culture from the throat on Loeffler's medium was negative for diphtheria. A throat culture on blood agar was negative for hemolytic streptococci, but there was an abundant growth of gram-negative biscuit-shaped diplococci simulating the gonococcus in morphology and colony appearance.

The throat was swabbed at frequent intervals with mild silver protein, and Dobell's solution was used as a gargle. The temperature gradually rose and on the second day a roughening of the first heart sound was noted over the aortic area and, during the second phase, along the left border of the sternum. The patient was also complaining of tenderness in the left wrist, although no tumefaction or rubedo was in evidence. The outlook for the patient was not pleasing. A gonorrheal rheumatism and endocarditis seemed imminent. He was given intravenously 2 cc. of sterile 2 per cent mercurochrome-220 soluble solution without any apparent reaction. This was given according to the method recommended by Allen.[1] The following day the temperature was not above normal at any time, even though there was no improvement in the feeling of the patient or in the appearance of the throat. On the second day following the first intravenous treatment the wrist was free from pain or tenderness and when I attempted to demonstrate the abnormal heart sounds no roughening was present nor have any abnormal heart sounds been detected since. On the third day following the first intravenous injection, 3 cc. (an increase of 1 cc.) of 2 per cent mercurochrome-220 soluble was administered in the same manner, again without immediate reaction, but a diffuse rubedo and tumefaction with marked tenderness of the cubital fossa appeared the following day, which was undoubtedly due to faulty technic on my part. This day at 4 p. m. the temperature reached the highest peak that it assumed during the entire course of the attack. The next or second day following the second injection the extremity was less painful and could be freely moved by the patient, and the nurse's early night report stated that he was feeling much better and had been comfortable all day. The patch on the left tonsil appeared to be somewhat smaller but persisted in spite of the frequent local applications and other treatment.

However, on the following or ninth day from the onset of the complication the patient's appetite was better and his general condition was encouraging. Improvement continued steadily until he was transferred from the isolation ward.

Following the second intravenous mercurochrome medication (3 cc.) there was a daily rise in temperature for three days. It was so slight on the third day that another (the third) injection 1 cc. larger, or 4 cc., was given on the next day. There was no local or systemic reaction, so on the second day following the third dose, 5 cc. was administered. Two days later 5 cc. was again given and two more 5 cc. doses were intravenously injected at three day intervals, following the last of which the throat was much less painful and displayed a patch the size of a small pea. It was seventeen days after the seventh or last injection before the condition of the throat had sufficiently subsided to warrant a negative report from the laboratory. In another week the patient was allowed to go to the general dining room for meals and has since been transferred to another ward. At his own request he has been working outside with the landscape occupational therapy detail without any untoward symptoms.

During the course of the tonsillar infection, readings of the temperature, pulse and respiration were taken every four hours, and after the mercurochrome was started a specimen of urine was sent to the laboratory daily. The specimen examined the morning following the first administration showed a "very faint trace of albumin; a few red blood cells, an abundance of pus cells and a few extracellular gram-negative biscuit-shaped diplococci." Albumin was not again reported. The red cells soon disappeared, but it was three weeks before an absence of pus cells was reported.

COMMENT

Since Young, White and Swartz at the Johns Hopkins Brady Urological Institute, in 1919, produced mercurochrome-220 soluble, the literature has been replete with reports and discussions relative to its use and action, so I shall let this recital speak for our opinion of its beneficial use in this condition.

Aside from the unusual form of tonsillar infection presented by this case, a speculation as to the mode of infection is interesting. A urethral gonorrhea in a psychotic noncooperative patient languishes for forty-nine days, when a complaint of "pain in the heart" is registered by the patient and nineteen days later, or sixty-eight days after the urethral infection, the left tonsil is found to have a peculiar appearing patch in which neisserian diplococci are abundant. No urethral discharge had been noted for some days nor was any present on this date. Ten days previous a smear had been negative for gonococci. On the seventieth day from the onset, roughening of the heart sounds was present and the left wrist was tender. The question arises, Was the "pain in the heart" evidence of a hemal infection and was the tonsil infected from the blood stream, or may we consider the "pain in the heart" due to indigestion and the sore throat the result of contamination from the urethra by way of the fingers, with the commencing arthritis and endocarditis secondary to the tonsillitis? In view of the interval between the "pain in the heart" and the sore throat (nineteen days), it seems more reasonable to presume that the blood stream infection was secondary, even though the laboratory reports on the urethral smears were negative. Smears were not made daily, and undoubtedly at times there were gonococci present after a supposed cessation of the urethritis.

1. Allen, C. D.: U. S. Vet. Bur. M. Bull. **2**: 443 (May) 1926.

ACCIDENTAL ELECTROCOAGULATION OF THE MALE GENITALIA

PAUL R. FARRINGTON, M.D., BOULDER, COLO.

This case of electrical burns is of interest because of the unusual distribution of the lesions, and their extensiveness, and because the patient recovered.

A telegraph lineman, aged 20, was seated astride a lead armored telegraph cable directly over an interurban trolley wire carrying a 25 cycle current of 11,000 volts. He was wrapping a splice in the cable with lead tape, when he allowed the roll of tape to slip from his hand. The strip of lead fell, unrolling as it went, and struck the trolley wire. Sufficient current passed to melt the tape almost instantly and to burn the man seriously.

When I first saw him he was in severe shock and great pain. His clothes were practically burned from his body. The entire anterior surface of the abdomen was burned. An area measuring 4 by 5 inches in the right lower quadrant had been coagulated to a depth that included the external oblique fascia. The penis, scrotum, mons veneris and abdominal wall, including the bladder wall and symphysis pubis, were coagulated. The right side of the neck showed a first degree burn covering an area 4 by 5 inches in size. There was a first degree burn of the left axilla, and first, second and third degree burns of approximately one third of the skin surface of the left arm. Five eighths of the thoracic skin was affected to a greater or less degree. Approximately 4 inches of the rib cartilages and ribs from the third to the seventh, inclusive, on the left side were devitalized. The

anterior surfaces of both thighs and the calf of the right leg were extensively burned.

Dressings consisting of zinc oxide ointment spread on gauze were applied, and intravenous infusions of saline and dextrose solution were administered.

He was unable to urinate and was catheterized for the first four days. The urine was almost black with hemoglobin. Three days after the accident all the deeply burned areas were incised to allow drainage of accumulated fluids from the deep tissues. The following day it was impossible to catheterize the patient because of curling and contraction of the penis. A trocar was inserted into the bladder suprapubically through the necrotic tissues and a permanent catheter was installed. After the necrotic tissues had sloughed away there was a suprapubic sinus 1 inch in diameter leading into the bladder. On the fifth day the hemoglobinuria was clearing rapidly. On the ninth day the penis separated one-half inch posterior to the angle. Two days later the scrotum and testicles fell away. One month after the accident the patient passed a small stone through the urethra. The cartilages of the third, fourth, fifth, sixth and seventh ribs with some attached bone were lifted away about six weeks after he was burned, leaving a deep cavity 4 by 9 inches directly over the heart. As soon as the deep burns were clean, Thiersch grafts were applied to them successfully. An indwelling catheter was used to keep the patient dry.

The burns gradually healed and the patient left the hospital four and one-half months after admission. Further reports stated that he had a left nephrectomy performed elsewhere as an emergency measure one month later for nephrolithiasis.

At the present time, six years after the accident, he is entirely well and is able to do light work steadily. He is able to urinate normally through the urethral stump and there is no suprapubic leakage.

2010 Twelfth Street.

POSTVACCINAL MYELITIS *

R. A. PERRITT, M.D., AND R. C. CARRELL, M.D., CHICAGO

While cases of encephalitis following antismallpox vaccination are not rare, those of postvaccinal myelitis are unusual. The case here recorded is of great interest also because of the long duration. At the time the patient entered the hospital, three and one-half years had elapsed since the onset.

REPORT OF CASE

History.—A white girl, aged 18, entered the neurologic service of the Cook County Hospital because of inability to walk. Three and one-half years previously she had been vaccinated on the left arm against smallpox. The next day the arm became tender, red and swollen. Two days later she developed a high fever, severe headaches, and pain in the legs and back. Her legs were drawn up, her head was retracted and she had to be catheterized. Nine days after the vaccination the acute symptoms subsided, but the patient's left arm and both legs became completely paralyzed; sensation was not affected. Slow improvement took place in the left arm, which recovered its function within six weeks after the onset of the illness. The legs, however, remained paralyzed; the urinary retention became an involuntary dribbling which gradually disappeared and within a few weeks the function of the bladder became normal. During the last three years the patient had improved to the extent that she could walk with support and by keeping the legs extended.

Examination.—The patient was well developed and nourished; the temperature, pulse and respiration were normal. Walking was possible only when the patient was supported; she moved the lower extremities with difficulty, and kept them extended; the left flexor and the right extensor muscles of the legs were paralyzed and markedly atrophied, and both feet were drooping. The knee jerks were absent bilaterally, and the achilles reflex was present on the right and absent on the left. There was marked hypotonia in the lower extremities; the upper were normal, not paralyzed or atrophied. Sensibility, coordination, motor power and the cranial nerves, including the pupils, were all normal. Electrical examination revealed failure of the left calf muscles, of the right peroneal nerve and of the muscles supplied by the latter to respond to the faradic current, while it required a strong galvanic stimulation to produce even a slight response from both peroneal nerves, especially the right.

Laboratory Examination.—The urine, blood and serologic observations in the spinal fluid and blood were all normal. The blood pressure was 128 systolic and 60 diastolic.

The diagnosis was lower flaccid paraplegia with partial reaction of degeneration; scattered muscular atrophies, and absence of sensory and genito-urinary disturbances.

COMMENT

The clinical picture was unquestionably that of anterior poliomyelitis which followed vaccination. Cases of postvaccinal disseminated encephalomyelitis in which both the brain and the spinal cord are involved have become of late, as has been said, not unusual, especially in Holland and England. Clinically they give a picture of diffuse involvement of the central nervous system and generally a grave prognosis (death in about 57 per cent). Pathologically such cases exhibit marked destruction of the parenchyma, especially of the white matter. Here the myelin is destroyed and areas of so-called demyelination occur. In Perdrau's [1] opinion the histologic changes are similar to those that occur in cases of encephalomyelitis caused by smallpox. In Spiller's case,[2] for instance, the anterior horns showed rather mild changes, but in some areas (lower cervical and lumbar) the nerve fibers of the anterior horns and of the white columns (midthoracic region) were especially involved. Spiller prefers to call the condition in his case poliomyelitis, which was also present clinically. The patient was a man, aged 38, who exhibited a flaccid paraplegia eight days after the eruption; the upper extremities were not involved; there was no pain, but the sensation was somewhat impaired; the bladder was extended up to the umbilicus; the mental condition was good. Death occurred on the thirty-sixth day of the disease. In another patient, a girl, aged 19, a severe smallpox progressed well up to the third week of the disease, when she became unable to move her legs in bed. Sensibility was somewhat impaired, and there was incontinence of the bladder and rectum. Death followed at the end of about eight or nine weeks.

The clinical picture in both cases resembles that presented by our patient. The difference is that in Spiller's cases the condition was caused by smallpox, while in our patient it was caused by cowpox or the vaccination against smallpox. It is most likely that the cases in both instances resemble each other not only clinically but also pathologically.

* From the Neurologic Service, Cook County Hospital.

1. Perdrau, J. R.: The Histology of Postvaccinal Encephalitis, J. Path. & Bact. **31**: 17 (Jan.) 1928.
2. Spiller, W. G.: A Report of Two Cases of Paraplegia Occurring in Variola, One Being a Case of Acute Poliomyelitis in an Adult, Brain **26**: 424, 1903.

Progress in Ophthalmology.—Like other sciences, ophthalmology did not progress and develop in steady and uniform steps. A complete stagnation occurred after the fall of the Roman Empire. This was not relieved to any considerable extent by the then famous Arabic oculists, who limited themselves to translating the works of the ancient authors, such as Hippocrates, Galenus and Celsus, with only poor additions of their own. The only progress in ophthalmology during the Middle Ages consisted in the invention of the spectacles, and that was not the work of an oculist but of scientists basing their work on Kepler's doctrines. The enormous modern development of ophthalmology has been the work of the last hundred years and is due to the invention of new methods of examination and modes of treatment, followed each time by a rapid progress in one field or another of ophthalmology. This is the usual way of development of any science, as can be well illustrated by one example, that of bacteriology. Pasteur first recognized bacteria to be the cause of the process of putrefaction. Then it occurred to Koch to use solid mediums to grow the cultures on instead of the bouillon of Pasteur, and this new method only made it possible to isolate colonies of various types and identify them. But for this comparatively simple step in the technic, bacteriology today might still be the science of Pasteur's time. In ophthalmology the invention of the ophthalmoscope played a similar rôle.—Fuchs, Ernst: *Arch. Ophth.*, February, 1930.

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SATURDAY, MARCH 15, 1930

METABOLIC "WASTE HEAT"

The theories with regard to the utilization of the energy of the different foodstuffs in muscular activity are experiencing some demands for revision. The assumption has been generally accepted that, while the work production—the muscular contraction—is primarily brought about by the conversion of glycogen into lactic acid, the heat production belongs to the recovery process, during which a portion of the lactic acid is oxidized and the remainder is retransformed into glycogen. The recovery processes thus referred to call for fuel. It was long believed that carbohydrate is the sole fuel of muscular contraction. Of late, however, experimental evidence has accumulated in support of the claim that this exclusive view is not universally tenable. For example, Rapport [1] has advanced the conclusion that not only carbohydrate but also fat can provide energy for muscular exercise, the amount of each that happens to be used in a particular case depending on the proportions in which these substances are presented in available form to the muscles. If this is correct, Rapport points out, it follows that the oxidative metabolism of contracting muscle is nonspecific; that is, that the energy for the endothermic processes of recovery can be furnished by the oxidation of more than one foodstuff.

In this connection, one may recall some of the peculiarities of the influence of food on metabolism. For some time after the ingestion of food, the calorific output is greater than that observed under the familiar basal conditions. This effect of foods in stimulating metabolism so that the heat output exceeds that which would be derived by oxidation of the actual amount fed has been termed specific dynamic action. It is most pronounced for ingested proteins or for some of the amino-acids that they yield; it is exhibited in lesser degree by fats and carbohydrates. The outcome of the reactions involved has been regarded as "waste heat," on the assumption that the extra energy released as the result of the specific dynamic action of the foodstuffs cannot be used for the performance of work.

Experiments by Rapport at Western Reserve University School of Medicine, Cleveland, challenge this assumption of waste energy. He admits that when an individual is at rest the stimulation of the cells to extra energy production results in exothermic reactions, which appear as heat and as such are useless for the performance of work. In muscular exercise, however, he finds that the energy of these reactions is utilized, and since the reactions involve the consumption of oxygen it may be assumed that they are utilized in the recovery process of muscular contraction. According to Rapport the specific dynamic action of fat, as well as that of dextrose, is abolished during muscular exercise and recovery; in other words, this extra energy, which at rest appears as waste heat, is utilized as free energy in muscular work. This, he adds, tends to confirm the nonspecificity of the oxidative recovery process of muscular contraction. However, there are limits to the application of the theory. Not all exothermic reactions can serve this purpose. The specific dynamic action of protein must still be regarded as affording "waste heat" alike during rest and during muscular activity.

1. Rapport, David: The Nature of the Foodstuffs Oxidized to Provide Energy in Muscular Exercise: III. The Utilization of the "Waste Heat" of Metabolism in Muscular Exercise, Am. J. Physiol. **91:** 238 (Dec.) 1929.

EMERGENCY LIFE-SAVING MEASURES

Artificial respiration by the prone pressure method is an important life-saving measure in cases of drowning, electrical shock, and acute artificial gas (carbon monoxide) poisoning. The patient must be kept warm. Inhalation of a mixture of 93 per cent oxygen and 7 per cent carbon dioxide is a valuable aid in restoring respiration in carbon monoxide poisoning and related asphyxias. The use of oxygen and carbon dioxide was advocated by Henderson and Haggard [1] in 1922. Drinker [2] called attention to these procedures in 1928, and more recently they have been reemphasized by the Committee on Poisonous Gases of the American Medical Association.[3] Some physicians still resort to methods of artificial respiration that are less effective. The prone pressure method was first advocated by Schäfer [4] in 1907. Every physician and medical student should familiarize himself with it, be able to apply it, and instruct others whenever there is opportunity for disseminating knowledge regarding first aid.

Both electrical shock and drowning produce forms of simple asphyxia. Acute poisoning from city illuminat-

1. Henderson, Yandell; and Haggard, H. W.: Treatment of Carbon Monoxide Asphyxia by Means of Oxygen-Carbon Dioxide Inhalation, J. A. M. A. **79:** 1137 (Sept. 30) 1922.

2. Drinker, C. K.: Acute Asphyxia as a Medical Problem, J. A. M. A. **90:** 1263 (April 21) 1928.

3. The Dangers of Carbon Monoxide Poisoning and Measures to Lessen These Dangers: Report of the Committee on Poisonous Gases of the American Medical Association, J. A. M. A. **94:** 179 (Jan. 18) 1930. Carbon Monoxide: Report of the Committee on Poisonous Gases, editorial, ibid., p. 186.

4. Schäfer, E. A.: Artificial Respiration in Man, Harvey Lectures, 1907-1908, Philadelphia, J. B. Lippincott Company, 1909, p. 223.

ing gas or automobile exhaust differs from them in that the blood is modified by carbon monoxide. In such accidents the heart fails slowly as asphyxia progresses. The ventricles will frequently recover, but recovery is slow. It is unsafe to pronounce an asphyxiated person dead on one examination. Repeated examinations should be made, and the entire absence of pulse and heart sounds, only after a long period of prone pressure artificial respiration, should cause the physician to declare the patient dead. In asphyxia, death should never be admitted until prone pressure artificial respiration has been used for at least an hour. Cases are recorded in which spontaneous breathing has occurred as long as eight hours after artificial respiration has been begun. The prone pressure method is the method of first avail, but as soon as possible an inhalator should be employed for administering oxygen and carbon monoxide. Measures should also be taken to keep the patient warm, and to prevent immediate muscular exercise.

The Management and Engineering Corporation, under the supervision of the director of safety, Mr. Gordon Wilson, is waging a campaign for the dissemination of information concerning the Schäfer method as an emergency life-saving measure. Mr. Wilson [5] calls attention to the fact that public utility companies are placing rescue crews at the disposal of the medical profession. Form letters have been sent to physicians in the cities in which these crews are available, telling them of the service and inviting them to make use of it. The campaign that is being conducted, and the aid that is being offered, are solely from the point of view of public service. Not only the rescue crews of utility corporations but certainly all hospitals and hospital ambulances should be equipped with inhalators.

Service of this nature has grown out of necessity. Although death from electrical shock or gas poisoning may be infrequent in any physician's practice, it is a fairly common occurrence among the employees and patrons of gas and light companies. They have met the need by organizing rescue squads that are available at all hours of the day and night and by training their employees in these life-saving measures. Their work has borne fruit. The American Medical Association Committee on Poisonous Gases has also emphasized its conviction that the less the hypodermic needle is used, particularly in cases of carbon monoxide asphyxia, the better it is for the patient. The rescue crews in general are trained for this particular procedure according to the carefully worked out directions of investigators and physicians who are especially experienced in this field. Practicing physicians will do well to cooperate with these crews in rendering aid in such emergencies.

5. Wilson, Gordon: When the Utility Employee Can Help the Doctor, National Safety News, October, 1929, p. 81.

DWARF BACTERIA AND PIGMY PROTOZOA

The rapidly increasing number of important human, veterinary and plant diseases now known or believed to be caused by filtrable viruses makes the determination of the nature of these unknown filter-passers an urgent problem of medical research. It is, of course, conceivable that these unknown filtrable agents are merely unusually small or unusually flaccid bacteria or protozoa. Such a concept would not introduce any new factors in current pathologic theory. Until this concept is proved, however, clinicians cannot lose sight of other possibilities. Certain bacteriologists have suggested that in time these filtrable infections will be shown to be due to some nonmicrobic "liquid life." For two or three decades botanists have entertained the hypothesis that certain filtrable plant diseases are due to self-propagating toxins, enzymes or "morbidic bions." Immunologists today are reacting favorably to the suggestion that eventually certain filtrable viruses will be shown to be due not to independent, organized living units [1] but to bacteriophage-like, pseudoproliferating, cellular autolysins or other intracellular derivatives. Such transmissible biochemical perversion would necessitate radical revisions of present methods of research and clinical attack.

The alleged evidence in support of such concepts has been drawn from the relatively high resistance of certain filtrable viruses to chemical antiseptics, from their relative insusceptibility to digestive enzymes, and their viability in spite of prolonged drying and other physical injuries. Such evidence, however, is not conclusive. Some bacteria are equally resistant to certain agents. A few filtrable viruses are so delicate as to be rendered noninfectious by slight errors in routine laboratory technic.

Alleged evidence of their nonmicrobic nature has been drawn also from studies of serum changes following artificial immunization. Rabbits injected with almost any ordinary bacteria will in time develop specific precipitins for bacterial proteins, specific complement-deviating substances, and other test-tube antibodies. Several investigators have reported negative results in attempts to demonstrate test-tube antibodies with filtrable viruses, the only antibodies conceded by them being antibodies demonstrable by therapeutic tests. Minute size or physical hyperflaccidity alone would not account for these alleged immunologic differences.

A careful reexamination of this serologic evidence has just been published by Bedson and Bland [2] of the London Hospital. By slight modifications and refinements of the technic used by previous workers, these investigators were able to demonstrate typical and abundant specific complement-deviating substances after

1. Zinsser, Hans; and Seastone, C. V., Jr.: Further studies on Herpes Virus: The Influence of Oxidation and Reduction on the Virulence of Herpes Filtrates, J. Immunol. **18**: 1 (Jan.) 1930.
2. Bedson, S. P., and Bland, J. O. W.: Complement-Fixation with Filtrable Viruses and Their Antisera, Brit. J. Exper. Path. **10**: 393 (Dec.) 1929.

immunization with vaccinia and herpes virus. The essential feature of the Bedson-Bland technic seems to be a limitation of all inoculations and tests to a single animal species, thus avoiding collateral interference with heterologous tissue products.

If the results of these British investigators are confirmed and are found equally true for other filtrable infections, clinicians, for the time at least, will be spared the necessity of assuming that unknown filter-passers are other than dwarf hyperflaccid bacteria, and can safely leave fourth-dimensional morbidic bions and other hormonal perverts to consideration by immunologic theorists.

THE LOSS OF PANCREATIC JUICE

For each type of gland functionally associated with the gastro-intestinal canal and the processes of alimentation there has at some time arisen the question of its indispensability for life. The salivary glands have been excised without fatal results in animals. Complete gastrectomy has been practiced with some success even in man. In the case of the pancreatic gland, it has long been apparent that two problems are involved. One relates to the production of a hormone, insulin, that is essential to carbohydrate metabolism. Unless adequate replacement therapy is instituted, life becomes impossible without the insulin-producing pancreatic tissue. The other factor is the external secretion of the gland—the pancreatic juice. Does it contain something unique that is indispensable for continued existence?

Evidence has been accumulating to show the comparatively rapid supervention of death in animals completely deprived of their pancreatic secretion, even though the pancreas itself is kept intact so that the production of insulin and other possible "internal secretions" may continue unchanged. Clinical conditions such as bilious vomiting, intestinal fistulas or protracted diarrhea may involve the loss of gastro-intestinal secretions. The physician is therefore eager to know the explanation of these untoward consequences.

Vomiting, in many cases, is a conspicuous symptom. This may lead to anhydremia and, if there is considerable loss of acid gastric juice in the vomitus, to an actual alkalosis. These consequences may be countered by suitable therapy. In the experiments of Elman and McCaughan [1] it was noted that if vomiting was averted the increased alkalinity of the blood was not deemed a sufficient cause for the deaths that occurred after complete loss of the pancreatic secretion. As the return of the secretion to the duodenum rapidly restored an animal to health, it was supposed that the pancreatic juice might contain some substance necessary to life.

In studies [2] at the Washington University Medical School, St. Louis, it has been found that, when total loss of pancreatic juice occurs under sterile conditions and in the absence of vomiting, the blood shortly before death shows extreme concentration, with marked reduction in base bicarbonate and p_H; that is, uncompensated acidosis. Such observations are what one might expect from a consideration of the alkaline composition of pancreatic juice. When severe vomiting occurred in addition, the acidosis was less marked, absent or even replaced by alkalosis due to the superimposed loss of acid gastric juice, thus explaining the early observations. Additional proof that the rapidly fatal outcome was due to simple chemical changes lay in the fact that death could be prevented and life prolonged during drainage of the pancreatic juice by the administration of a sufficient quantity of Ringer's solution. Water alone, or with added dextrose, had no beneficial effects. The value of a simple physiologic solution of sodium, potassium and calcium chlorides is thus shown.

Animals deprived of their alkaline pancreatic juice are known to develop ulcers in the duodenal region. This emphasizes anew the protective value of the alkaline juice in neutralizing the acid contents discharged through the pylorus from the stomach. The St. Louis investigators noted these lesions and remarked that they may serve to explain the gastric irritability and vomiting. Evidently, loss of alkali or acid as represented in the two digestive secretions of the pancreas and the stomach are menaces to well being that were formerly little realized. To them may be added dehydration with its resulting changes in the circulation. All these abnormalities, fortunately, are amenable to simple therapeutic measures. The symptoms need to be better recognized in everyday practice.

1. Elman, Robert; and McCaughan, J. M.: J. Exper. Med. **45**: 561 (March) 1927.

2. Hartmann, A. F., and Elman, Robert: J. Exper. Med. **50**: 387 (Sept.) 1929. Elman, Robert; and Hartmann, A. F.: The Cause of Death Following Rapidly the Total Loss of Pancreatic Juice, Arch. Surg. **20**: 333 (Feb.) 1930.

Current Comment

DEATH OF BERLIN CORRESPONDENT OF THE JOURNAL

Dr. Julius Schwalbe, editor of the *Deutsche medizinische Wochenschrift*, and for nearly twenty-two years Berlin correspondent of THE JOURNAL, died suddenly, February 17, aged 66. Dr. Schwalbe apparently had been in good health until stricken and until then sent to THE JOURNAL each week his letter from Berlin. He was licensed in 1886 and for several years engaged in practice. He became editor of the *Fortschritte der Krankenpflege* in 1892 and editor in conjunction with Eulenberg of the *Deutsche medizinische Wochenschrift* in 1894. In 1904 he became chief editor. Under his direction that journal became widely known. Dr. Schwalbe, while a young intern in the city hospital at Friedrichshain, wrote a number of clinical articles and in later years published several works in conjunction with other writers, the most notable being the "Lehrbuch der Greisenkrankheit," the six volume "Handbuch der praktischen Medizin" and the "Therapeutische Technik für die ärztliche Praxis," all of which have been translated into foreign languages. In collaboration with

Professor Pogel, he published "Speemann's Historischer Medizinal-Kalender" and the "Chirurgie des praktischen Arztes." He published the only reliable German medical directory, was for a long time secretary of the Berlin Physicians' Council, and was a founder and president of the Robert Koch Foundation. Dr. Schwalbe was respected by German physicians not only as a writer but also for his fearless stand on questions pertaining to medical practice.

DUODENAL HUNGER CONTRACTIONS

The researches of Carlson in Chicago and of Cannon in Boston have helped to formulate the now widely accepted dictum that hunger is due to pronounced motor activity of the stomach. The sensation of hunger becomes temporarily appeased when the stomach becomes filled, even with indigestible or non-nutritious materials; for the gastric movements are thereby inhibited. Of late, relatively simple technic has been developed for studying the muscular movements of the duodenum in man by the balloon method. Contractions of this part of the intestine have been observed during periods of hunger, but they have been regarded as a continuation or passage of the gastric movements from the stomach down to the duodenum. Recently, Quigley and Solomon [1] of the University of Chicago have observed "vigorous duodenal contractions during a period of complete gastric rest." Hunger sensations were reported at the same time. The response of the duodenum as well as of the stomach can be inhibited by the passage of food into the intestine. The conception of hunger sensations must therefore be enlarged to include the effects of duodenal contractions as well as the more familiar—and probably far more common and characteristic—changes in gastric motility.

THE DETECTION OF INTRACRANIAL PRESSURE

Observations on the spinal reflexes are commonly made a part of certain diagnostic routines. Disease or injury to the afferent nerve, the efferent nerve or the spinal gray matter abolishes them. The absence of the reflexes is therefore an important sign of disease of the spinal cord or the nerve roots. Perversions of the tendon reflexes are far more significant than changes in the superficial reflexes. The latter tend to be more variable and may at times fail even in the absence of detectable nervous disease. The knee jerk has attained foremost consideration clinically, and it can also be measured with some accuracy in the laboratory. For these reasons the patellar jerk has been made the subject of renewed investigations by Montgomery and Luckhardt [2] in the Physiology Laboratory of the University of Chicago to ascertain whether it would yield information of prognostic significance in relation to raised intracranial pressure following trauma. The inquiry is by no means entirely new, but neurologists have not been in accord as to the clinical pictures involved. In these studies, intracranial pressure was raised artificially through trephined openings in the skull or the upper lumbar region of the spinal column of animals. The experiments showed clearly that increasing the intracranial pressure to a point at which it approaches the carotid arterial blood pressure leads to a fairly abrupt diminution in the height or abolition of the knee jerk, preceded in some instances by a few jerks of increased amplitude. If the cord has been cut above the knee jerk center, the knee jerk is not affected until the respiratory and vasomotor centers have been paralyzed. The abolition of the knee jerk then seen is due to asphyxia of the center, and perhaps also to inadequate circulation through the center. Montgomery and Luckhardt conclude that, on the basis of their experiments, a sudden gross diminution in or complete abolition of the knee jerk observed in clinical cases of raised intracranial pressure would seem to denote that the intracranial pressure is mounting to a dangerous level. The diminution or abolition of the knee jerk may be of value in indicating the necessity of early operative intervention. The Chicago experiments thus present the desirability of further clinical study of the problem.

1. Quigley, J. P., and Solomon, E. I.: Action of Insulin on the Motility of the Gastro-Intestinal Tract: V. Am. J. Physiol. **91:** 488 (Jan.) 1930.
2. Montgomery, Mary F., and Luckhardt, A. B.: Studies on the Knee Jerk: VIII. The Effects of Acutely Raised Intracranial and Intraspinal Pressures on the Knee Jerk, Am. J. Physiol. **91:** 210 (Dec.) 1929.

THE ETIOLOGY OF TRACHOMA

The cause of trachoma has remained as one of the perennial mysteries of medicine. There are many features of the disorder that suggest a microbic origin, but the etiologic agent has been decidedly elusive. A while ago, belief in the protozoan nature of the parasite gained some headway.[1] It was based on the alleged occurrence of tiny granules known as Prowazek's bodies in affected portions of the eye, sometimes within the cells and at other times free in the serum. The so-called trachoma inclusions have since been demonstrated to be nonspecific. They are probably "nests" of growing bacteria of various kinds found in all sorts of eye infections or inflammations. Some observers of trachoma have speculated on the possibility of its representing, in some measure at least, a nutritional deficiency. Shortly before his lamented death, Noguchi [2] announced the isolation of a micro-organism, *Bacterium granulosis,* which he regarded as a causative agent in connection with trachoma. The studies have been repeated in Indian schools in the Southwest by Tilden and Tyler,[3] likewise of the Rockefeller Institute for Medical Research. They secured several strains of the same bacterium from advanced untreated cases of the disease. These agree culturally in all respects with the Noguchi bacterium. Inoculation tests with the new cultures in macacus monkeys induced the characteristic granular lesions of the conjunctiva. The production of trachomatous symptoms, appearing first on the twelfth day and progressing to abundant development during the following weeks, represents an important step forward in the study of a distressing malady.

1. Chandler, A. C.: Animal Parasites and Human Disease, New York, John Wiley & Sons, 1922.
2. Noguchi, Hideyo: J. Exper. Med. **48,** supp. 2, 1928.
3. Tilden, E. B., and Tyler, J. R.: Bacterium Granulosis and Trachoma, Science **71:** 186 (Feb. 14) 1930.

Association News

MEDICAL BROADCAST FOR THE WEEK

American Medical Association Health Talks

The American Medical Association broadcasts daily at 10 o'clock, Central Standard Time, with the exception of Tuesday, when the health message is delivered at 9:30, and Friday, at 9:45, over Station WBBM (770 kilocycles, or 389.4 meters).

The program for the week of March 17-22 is as follows:

March 17. How Nerves Go Bad.
March 18. How Nerves Go Bad (continued).
March 19. The Nature of Cancer.
March 20. The Care of the Skin.
March 21. The Way of the Vegetarian.
March 22. "Patent Medicine" in China.

Five Minute Health Talks may be heard over the Columbia Broadcasting System daily from 12 noon to 12:05 p. m.

The program for the week is as follows:

March 17. Let Me Ask You These.
March 18. Beware of That Deadly Carbon Monoxide.
March 19. Light Lightens Living.
March 20. Wanted—A Light Job in the Open.
March 21. Mark Twain on "Man."
March 22. The Marvelous Mesmer.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARKANSAS

Society News.—The Union County Medical Society was host to the Tri-County Medical Society (Union, Ouachita, Columbia), recently; Dr. Paul L. Mahoney, Little Rock, spoke on focal infections, and Dr. Guy A. Caldwell, Shreveport, gave a demonstration of reduction of fractures.

CALIFORNIA

Personal.—Dr. Frank L. Horne has been appointed health officer of El Cerrito, succeeding Dr. Robert A. Steven.—— Dr. Emmet Rixford, professor of surgery at Stanford University School of Medicine, will be tendered a luncheon, March 27, by the San Francisco Hospital Surgical Colloquium, on the occasion of his sixty-fifth birthday.

Rabies Becomes a Greater Problem.—The California State Department of Public Health says that the control of rabies becomes a greater problem each year. Nearly 800 cases in animals have occurred in each of the last two years and up to February 8 of the present year ninety-four cases had been reported. Forty-nine human deaths from rabies have occurred in the ten year period ended 1929. To be bitten by a rabid dog is not always essential in order to contract rabies; it can be contracted through handling rabid animals, the infective agent gaining entrance through wounds in the skin. Its control is of the utmost importance.

Society News.—Drs. Walter B. Coffey and John D. Humber will soon present "A Preliminary Report on a Potent Extract from the Cortical Substance of the Suprarenal" before the San Francisco County Medical Society.——At a joint meeting of the Los Angeles County medical and bar associations, February 20, District Attorney Buron Fitts spoke on "Law Enforcement"; Judge Charles W. Fricke, "Medicolegal Work," and Dr. Angus McLean, Detroit, "Medical Economics."——The San Francisco Pathological Society was addressed, March 3, by Dr. E. W. Smith on "Carcinoma of the Gallbladder," and Dr. Hiram E. Miller, "Chronic Coccidioidal Dermatitis."——Dr. C. Frederic Fluhmann spoke before the San Francisco County Medical Society, March 11, on "Significance of Anterior Pituitary Hormone in the Blood of Women."

Committee to Study Undulant Fever.—A group has been organized to study the cause and prevention of undulant fever. Karl F. Meyer, Ph.D., director, Hooper Foundation for Medical Research, University of California, will serve as chairman, and Clarence M. Haring, D.V.M., as secretary. The specific purpose of the committee will be to plan, correlate and execute with available funds and personnel a number of experiments on the epidemiology, bacteriology and eradication of the diseases caused by *Brucella* organisms, in both man and animals. Infections of human beings with these organisms have, in various parts of the world, been called Malta, Mediterranean, Rock, Cretan, Cyprus and Danube fever, but now generally are grouped under the term undulant fever. Attention has been drawn to this problem by the prevalence of contagious abortion in cattle in the West, and the apparent increase of undulant fever in human beings. In 1927, there were fifteen cases in California; in 1928, eleven cases, and in 1929, sixty-nine cases.

DISTRICT OF COLUMBIA

Psittacosis Attacks Two More Laboratory Workers.—Two more employees of the Hygienic Laboratory of the U. S. Public Health Service, Washington, D. C., are ill from what is believed to psittacosis. Those most recently taken ill are Mrs. Sadie Carlin, who has been an employee for years, and Robert Lannon, a watchman at the laboratory. The psittacosis outbreak in the laboratory already has cost the life of one worker, Harry P. Anderson, and the serious illness of Dr. Charles L. G. Armstrong.

ILLINOIS

Society News.—Dr. Alfred A. Eggleston, Burlington, Iowa, among others, addressed the Adams County Medical Society, Quincy, March 10, on the diagnosis and treatment of carcinoma of the stomach. The society held a symposium on obstetrics, February 10.

Health Promotion Program.—Governor Emmerson has proclaimed April 27 to May 3 as Health Promotion Week. May 1 will be Child Health Day. A program has been planned especially for civic leaders to disseminate information about preventive medicine, and themes have been suggested for addresses for the days designated as Health Sunday, Health Education Day, Dental Hygiene Day, Parent Education Day, Child Health Day, Vaccination Day and House Screening Day.

Chicago

Society News.—The Chicago Gynecological Society will be addressed at the Murphy Memorial Building, 50 East Erie Street, March 21, by R. G. Gustavson, Ph.D., on "The Female Sex Hormone"; Dr. Edward L. Cornell will present a motion picture case report of an abdominal pregnancy with living child.

Dr. Flexner Gives Gehrmann Lectures.—Dr. Simon Flexner, director, Rockefeller Institute for Medical Research, New York, will deliver the Gehrmann lectures for 1929-1930 at the University of Illinois College of Medicine, 1817 West Polk Street, at 4:30 p. m., March 27-28. The first lecture will be on "The Epidemiology of Poliomyelitis," and the second on "Epidemic and Postvaccinal Encephalitis and Allied Conditions."

Examination of Workers in Summer Camps.—At the annual meeting of the Camp Directors Association, recently, it was recommended that examinations of all workers in kitchens in summer camps be insisted on. As a result of a study conducted by the National Safety Council, it was shown that camp illness and accidents, while few, are more prevalent among boys than girls. The object is to eliminate communicable disease and insure better health for campers.

INDIANA

Society News.—Dr. Thurman B. Rice will address the Indianapolis Medical Society, March 18, on "Newer Aspects of Bacteriology," and Dr. Jacob K. Berman, on "Hyperthyroidism in Emergency Surgical Operations"; Dr. Samuel Iglauer, Cincinnati, will address the society, March 25, on bronchography, with lantern slides.——Dr. Arlie R. Barnes, Rochester, Minn., addressed the St. Joseph County Medical Society, Febuary 19, on "Coronary Occlusions," illustrated with slides.——The Tippecanoe County Medical Society, Lafayette, was addressed, March 13, by Dr. Arthur M. Mendenhall, Indianapolis, on "Some of the Newer Things in Obstetrics."

IOWA

Executive Secretary Appointed.—Edwin M. Kingery has been appointed executive secretary of the Polk County Medical Society. New offices of the society have been established on the eleventh floor of the Bankers Trust Building, Des Moines. The society plans to issue a bulletin, the first number to appear about March 20.

KANSAS

Bill Introduced. — H. B. 7 proposes to abolish all the various boards for the examination and licensing of applicants to practice professions, including the board of medical registration and examination, and to vest all the duties, powers and obligations imposed by the present law in those boards on the state board of health.

KENTUCKY

Bill Introduced.—S. B. 383 proposes to amend the law regulating the practice of optometry by providing for the revocation of the license of any optometrist who practices as an itinerant pedler.

Society News.—The Graves County Medical Society will be addressed, March 18, by Drs. James W. T. Fuller and John Ray Pryor, Mayfield, on the medical and surgical aspects of ulcers of the stomach.——Dr. John R. Wathen, Louisville, addressed a joint meeting of the medical societies of Adair, Green and Taylor counties, recently, at Campbellsville, on "The Vaginal Route in Pelvic Surgery."

MARYLAND

Hospital News.—The new $2,500,000 building program for the Baltimore City Hospitals has been approved. It is planned, among other things, to use the existing main building as an infirmary, to erect a $450,000 nurses' home, to build a tuberculosis ward costing $220,000, and to construct several hospital buildings, including accident and psychopathic wards, to cost $1,500,000.

Society News.—The twelfth annual conference of the Health Officers and Boards of Health of Maryland will be held at the headquarters of the state department of health, 2411 North Charles Street, Baltimore, May 9-10.——At the meeting of the Johns Hopkins Surgical Society and Medical Association, Baltimore, February 28-March 1, papers were given, among others, by Dr. William C. MacCarty, Rochester, Minn., on "Review of the Cancer-Ulcer Problem"; Dr. Julian Deryl Hart, "Tuberculous Empyema," and Dr. Harold Finkelstein and Mr. Edgar J. Poth, "Experiments in Cross Circulation."——Dr. Manfred S. Guttmacher addressed the Johns Hopkins Medical Historical Club, February 24, on "James Graham, Eighteenth Century Baltimore Practitioner and Prince of British Quacks," and Dr. William H. Welch on "Surgery of the Eighteenth Century in England."

Request for Loan of Medical Relics.—A campaign has been started to discover early medical relics of Allegany County that the county may be represented at the hundredth anniversary celebration of the founding of the library of the Medical and Chirurgical Faculty of Maryland, April 22-May 2. All descendants and relatives of early Maryland physicians and surgeons are asked to contribute instruments, portraits, prints, relics, books, newspaper clippings or other material bearing on medical men, institutions or practice in the state in the 1830 period. Material relating to the practice, life and histories of Drs. Benjamin Murrow, James Forbes and George Lynn, the three physicians from this county who were among the 101 founders of the library, is especially desired, as is a copy of the first catalogue printed in 1865. All articles will be insured, and, if desired, returned to the owners following the exhibition. The library, founded through the efforts of Dr. Samuel Baker, has grown from a handful of books to one containing more than 60,000 volumes at the disposal of the physicians of the state. Dr. Walter D. Wise, 1211 Cathedral Street, Baltimore, is the chairman of the exhibition committee.

MICHIGAN

Personal.—Dr. Eugene E. Brunson, Ganges, who has been practicing for fifty-five years in the same rural community, was guest of honor, March 7, at the annual Rural Progress Day program held at the Western State Teachers' College. Dr. Brunson is 83 years old.

Dr. Cabot Goes to Rochester.—According to the Chicago *Tribune*, Dr. Hugh Cabot announced his appointment, March 5, as senior consultant at the Mayo Clinic, Rochester, Minn., effective June 1. Dr. Cabot has been dean of the University of Michigan Medical School since 1921, and, since 1919, professor of surgery. It is reported that Dr. Frederick A. Coller will assume the duties in the department of surgery to succeed Dr. Cabot.

Society News.—The state medical journal announces that the medical history of Michigan is in the process of publication. Dr. Colonel B. Burr, Flint, was chosen as editor and historian of the work four years ago by the council of the Michigan State Medical Society. —— The Manistee County Medical Society was addressed, recently, by Dr. Kathryn M. E. Bryan, Cadillac, on "Neuroses." —— Dr. Joseph G. Israel, Detroit, addressed the Macomb County Medical Society, March 3, on "New Ideas of Hyperthyroidism."

MINNESOTA

Eleven Milestones in Medicine.—The professional staffs of the Mayo Clinic and the Mayo Foundation, Minneapolis, presented a medical pageant, January 10, representing "eleven milestones in the progress of medicine"—Hippocrates, Claudius Galenus, Andreas Vesalius, William Harvey, John Hunter, Edward Jenner, Crawford Long, Rudolph Virchow, Louis Pasteur, Joseph Lister and Robert Koch. Laënnec, one of the most worthy as the originator of methods of clinical diagnosis, had to be omitted owing to the unexpected absence of the portrayer. A similar pageant was presented about a year ago by the Fulton County Medical Society, Atlanta, Ga. (THE JOURNAL, March 9, 1929, p. 814).

MISSISSIPPI

Bill Introduced.—H. B. 275 proposes to allow drug stores to remain open on Sundays.

MONTANA

Rocky Mountain Spotted Fever. — The department of public health has sent out warnings concerning the approaching Rocky Mountain spotted fever season. Evidence collected in recent years indicates that vaccination has proved to be of distinct value. It is recommended that persons whose occupations require them to visit infected areas be vaccinated. The vaccine is produced at the board of entomology laboratory at Hamilton by the U. S. Public Health Service and is furnished to physicians without charge. R. R. Parker, U. S. Public Health Service, is in charge of the production of vaccine. Last year there were twenty cases of Rocky Mountain spotted fever reported in Montana, with seven deaths.

NEBRASKA

Society News. — The Omaha-Douglas County Medical Society was addressed, February 25, by Dr. George Alexander Young, among others, on "Unusual Compression Syndrome of the Spinal Cord," and Dr. Sebastian J. Carnazzo, "Cholelithiasis and Double Cystic Duct."——The Madison Five County Medical Society was addressed, January 21, by Dr. William O. Colburn, Lincoln, on "Respiratory Diseases in Children"; Dr. Hiram W. Orr, Lincoln, on "Wound Infections and Local Suppurations," and Dr. Philip H. Bartholomew, director, state department of health, on contagious and infectious diseases.

NEW YORK

Public Health Courses at Columbia.—To comply with the requirements of the New York State Department of Education for school health supervisors, Columbia University will offer in its summer session, June 16-July 2, courses on school health supervision, medical inspection, mental hygiene and physical education. Applications should be submitted, prior to June 1, to the assistant registrar, 630 West One Hundred and Sixty-Eighth Street. Six points of credit are received on completion of the course; tuition is charged at the rate of $10 per point, plus a university fee of $7.

Bills Introduced.—H. B. 1553 proposes to amend the workmen's compensation law by adding to the list of compensable occupational diseases all disabling diseases and disabling illnesses arising out of any employment covered by the law. S. B. 1029 proposes to require the licensing of all hospitals of two or more beds. H. B. 1356 proposes to amend the laws regulating the practice of pharmacy by providing for the annual registration of all licensed pharmacists and licensed druggists. H. B. 1365 proposes to amend the law regulating the practice of dentistry by providing that the term of the board of dental examiners shall be three years. H. B. 1366 proposes to amend the law regulating the practice of dentistry by repealing the provision authorizing the licensing of master dental technicians. H. B. 1517 proposes to amend the medical practice act by providing that the board of regents may issue a license to practice medicine by reciprocity to a licentiate of another state who has been in the lawful and reputable practice of his profession for a period of not less than two years.

New York City

Personal.—One of three medals awarded annually by *Better Times*, for distinguished social service to the city, was presented, March 4, to Dr. Shirley W. Wynne, commissioner of health.

Sixth Harvey Lecture.—Dr. Esmond R. Long, professor of pathology, University of Chicago School of Medicine, Chicago, will deliver the sixth Harvey Society lecture at the New York Academy of Medicine, March 20, on "A Chemical View of the Pathogenesis of Tuberculosis."

NORTH DAKOTA

Society News.—The Sixth District Medical Society was addressed, February 18, at Bismarck, by Dr. Percy L. Owens on "Common Causes of Leukorrhea and Its Treatment," and Dr. John Crawford, New Rockford, "Causes and Prevention of Malpractice Suits." Motion pictures on obstetrics and gynecology were shown; they were made at the Wertheim Clinic in Austria by the late Professors Wertheim and Weibel.

OHIO

Personal.—Dr. Carl F. Ulrich, demonstrator in pediatrics, Western Reserve University School of Medicine, Cleveland, has been awarded a fellowship by the National Committee for Mental Hygiene; he will devote a year to research in psychiatry, spending most of this time at the Pennsylvania Hospital, Philadelphia.——The Logan County Medical Society recently tendered a testimonial dinner to Dr. Ben S. Leonard, West Liberty, on his completion of fifty years in the practice of medicine. Dr. Leonard was presented with a leather traveling bag.——Dr. Joseph H. Todd, Wooster, recently celebrated his ninety-third birthday; he is still in the active practice of medicine.

Illegal Practitioners Prosecuted.—The Ohio State Medical Board reports the prosecution of, among others, the following illegal practitioners:

Carl Reynard, convicted of illegal practice of medicine; municipal court of Newark, Licking County; fined $25 and costs.

Mary Lenk, practiced medicine illegally; municipal court, Toledo; fined $25 and costs.

James R. Monroe, convicted of advertising himself as an osteopathic practitioner; municipal court, Toledo; fined $25 and costs.

Elmer G. Lindsay, practicing medicine and surgery without a certificate; pleaded guilty; fined $200 and costs.

Upadesak Panditiji, municipal court, Cleveland; Yogi healer; fined $200 and costs.

Graham W. Scott, unlawful practice, using the title "doctor"; municipal court, Cleveland; fined $200 and costs.

R. L. Millhorn, found guilty of practicing medicine without a license; municipal court, Portsmouth; fined $250 and costs.

During a ten year period the department filed 1,468 affidavits and made 3,331 investigations; it secured convictions in 1,109 cases; 196 individuals ceased practice; 172 left the state, and 111 were dismissed.

Society News.—The Academy of Medicine of Cleveland will be addressed, March 21, by Drs. Alan R. Moritz and Evarts A. Graham, St. Louis, on "Interacinal Epithelium of the Thyroid Gland" and "Surgical Significance of Tests of Hepatic Excretion," respectively.——Trustees of the Radium Foundation have recently placed radium at the Lakeside Hospital for the use of patients in the Lakeside and City hospitals; the anonymous donor wishes this radium to be available to patients unable to pay.——Dr. Gerald S. Shibley has been appointed associate professor of medicine at Western Reserve University School of Medicine, effective July 1; he will occupy a similar position on the staff of the Lakeside Hospital. Dr. Shibley is now assistant professor of medicine at Columbia University and in the Presbyterian Hospital, New York.——Dr. Edward H. Wilson, Columbus, addressed the Hempstead Academy of Medicine, February 10, on "Chronic Arthritis."——The Doctors' Orchestra of Akron played for the first time for a nonmedical audience, February 19. The program was broadcast over WFJC, Akron. The orchestra, composed of thirty-seven members of the medical and dental professions, opened its series of hospital concerts, February 27.——Dr. Earl W. Huffer, Toledo, addressed the Hancock County Medical Society, Findlay, February 5, on "Obstruction at the Bladder Neck."——The Summit County Medical Society was addressed at Akron, February 4, by Dr. William Mithoefer, Cincinnati, on "Various Aspects Concerning the Nasal Accessory Sinuses."——Dr. Claude B. Norris, Youngstown, addressed the Columbiana County Medical Society, recently, on "Some Practical Considerations of Skin Diseases from the Standpoint of the General Practitioner."——Fifty milligrams of radium, said to be worth $4,000, was accidentally burned with some surgical dressings at the Aultman Hospital, Canton; the radium was retrieved from the furnace with an electroscope.——The Toledo Academy of Medicine was addressed, March 7, by Dr. John H. J. Upham, Columbus, on "Fetal Liver Feeding in Aplastic Anemia with Case Report." The academy is sponsoring a clinical tour to Chicago, March 20-21; the first day will be spent in Cook County Hospital, and the second in various clinics at other hospitals.——The Summit County Medical Society will be addressed, April 1, by Dr. Walter G. Stern, Cleveland, on random thoughts concerning physical therapy.

PENNSYLVANIA

Herb Doctor Sentenced.—S. D. Baker, Osceola Mills, herb doctor, recently pleaded guilty to a second charge of practicing medicine without a license and was sentenced to pay a fine of $300. Sentence was suspended for a period of three years contingent on future good behavior.

Society News.—Drs. Robert H. Jeffrey and Ralph P. Beatty addressed the Fayette County Medical Society, Uniontown, March 6, on fractures and urinary retention, respectively.——The Dauphin County Medical Society, Harrisburg, was addressed, recently, by Dr. John M. Campbell on infectious diseases; Dr. George R. Moffitt spoke, March 4, on "Meningitis."——Dr. Arthur C. Morgan, Philadelphia, addressed the Harrisburg Academy of Medicine, February 18, on "Cardiorenal Disease." "Present-Day Indications for Cesarean Section" will be the subject of Dr. George M. Boyd, Philadelphia, before the academy, March 18.——Dr. George W. Crile, Cleveland, addressed the McKeesport Academy of Medicine, McKeesport, February 24, on "End-Results in Twenty Thousand Operative Cases of Thyroid Disease."

Philadelphia

Society News.—In the afternoon graduate seminar, March 7, under the auspices of the Philadelphia County Medical Society, Dr. Damaso De Rivas spoke on "Pathology of Parasitic Diseases in Relation to Medicine and Surgery; Also Blood Pictures on Anemias."——The Philadelphia Academy of Surgery was addressed, March 3, among others by Dr. John P. North on "Use of Welch Bacillus Antitoxin in Intestinal Obstruction"; Dr. Charles H. Frazier, "Parathyroid Transplantation in Parathyroid Tetany"; Dr. Richard H. Overholt, "Observations on Intraperitoneal Pressure," and Dr. J. T. Lacey, Jr., "Use of Amniotic Fluid in the Prevention of Adhesions."——Dr. Charles H. Smith, New York, will address the Bauer Pediatric Society of Jefferson Medical College, March 19, on tuberculosis in children.——Dr. William L. Bradford, Rochester, N. Y., addressed the Philadelphia Pediatric Society, March 11, on "Influence of Radiation on Infections Associated with Deficiencies of Vitamin A in the Rat," and Dr. Samuel W. Clausen, on "Clinical Studies of the Influence of Nutrition on Susceptibility to Infection in Infants."——The Philadelphia County Medical Society will be addressed, March 24, by Dr. Morris Fishbein, Chicago, editor of THE JOURNAL, on "Prolongation of Life"; this lecture will be open to the public. A symposium will be held by the society, March 26, on the common cold. Those participating in the discussion will be Dr. Peter K. Olitsky of the Rockefeller Institute, New York; Dr. Dean F. Smiley, Ithaca, N. Y.; Dr. Edward L. Bauer, Philadelphia Department of Health; Mr. Harold S. Keller, medical department, Bell Telephone Company, and Dr. John A. Kolmer, Graduate School of Medicine of the University of Pennsylvania.

SOUTH CAROLINA

Bill Introduced.—H. B. 1220 proposes to create a board of barber examiners and to regulate the practice of barbering.

Society News.—The Kershaw County Medical Society was addressed, recently, in Camden by Dr. John W. A. Sanders, Lugoff, on diagnosis of children's diseases.——Among others, Dr. Joseph A. Dillard, Columbia, addressed the Second District Medical Association, Leesville, January 15, on "Suppurative Pericarditis," and Dr. Frank M. Durham, Columbia, "Pitfalls of Proctology."

SOUTH DAKOTA

Hospital News.—An announcement has been made of a gift of $30,000 to the Hospital Holding Corporation at Vermilion from Mrs. M. D. Thompson and her sons for a community hospital in memory of her husband. It will be known as the Myron D. Thompson Memorial Hospital and will have a capacity of twenty-eight beds; it will be built in units.

TEXAS

Bill Introduced.—H. B. 15 proposes to levy an annual tax of $50 on itinerant physicians, surgeons, oculists or medical or other specialists of any kind.

UTAH

Bill Introduced.—H. B. 10 proposes to create the office of state psychiatrist.

VIRGINIA

Bill Introduced.—H. B. 323 proposes to provide that no person other than a licensed pharmacist shall sell any hypnotic drug, and defines hypnotic drug as including sulphonmethane, sulphonethylmethane, diethyl sulphondiethylmethane, diethyl barbituric acid, or any compound, preparation, mixture or solution thereof.

WEST VIRGINIA

Society News.—Dr. Thomas F. E. Bess, Keyser, among others, addressed the Kanawha Medical Society, January 6, on "Sterilization of Mental Defectives and Criminals in West Virginia"; the society was addressed, January 21, by Dr. Benjamin H. Swint, Charleston, on "Vaginal Hysterectomy." Dr. Walter W. Point, Jr., spoke, February 4, on "The Average Case of Pregnancy and Labor," and Dr. Grattan G. Irwin showed a moving picture entitled "Benign Hypertrophy of the Prostate." The society was addressed, February 18, by Drs. Rome H. Walker and John B. Banks on "Rupture of the Rectum" and "Acute Appendicitis," respectively. —— The Cabell County Medical Society was addressed, January 9, by Dr. Robert A. Keilty, Washington, D. C., on "Vaccine Therapy." —— Dr. Myron Metzenbaum, Cleveland, addressed the Ohio County Medical Society, Wheeling, February 7, on "Nasal Function Restoration, Indications and Benefits." —— The Raleigh County Medical Society was addressed, February 20, by Dr. Archibald P. Hudgins, Hinton, on "Negative Wassermann Syphilis."——Dr. Howard R. Sauder, Wheeling, addressed the Lewis County Medical Society, recently, on "Early Diagnosis of Chronic Heart Disease." —— Dr. George F. Hull, Durbin, talked on the needs of medical legislation in West Virginia before the Greenbrier Valley Medical Society, February 5, and Dr. Norman R. Price, Marlinton, spoke on "State Medicine."

GENERAL

Warning.—Physicians are advised not to pay money to L. F. Whittaker, aged about 21, of slender build, about 5 feet 6 inches tall, and of fair complexion. He has been calling on physicians in Kansas City and Wichita, and collecting fellowship dues and subscriptions to publications of the American Medical Association. He has never been authorized to solicit or collect funds for the Association.

Society News.—The twenty-third annual convention of the American Home Economics Association will be held in Denver, June 24-28, with headquarters at the Cosmopolitan Hotel.—— The eighth International Congress of Dermatology and Syphilology will be held in Copenhagen, August 5-8. The secretary general of the committee on organization is Dr. S. Lomholt, Raadhusplads 45, Copenhagen, Denmark.

Bequests and Donations. — The following bequests and donations have recently been announced:

Pennsylvania Hospital, Philadelphia, $10,000 for the endowment of a bed in memory of her husband, Robert Hammond, and Wills Eye Hospital, $5,000 by the will of the late Mrs. Emma Hammond.

Methodist-Episcopal Hospital, $10,000, by the will of the late Dr. Philip H. Moore, Philadelphia.

Maine General Hospital, Portland, $5,000, and Massachusetts General Hospital, the bulk of the estate by the will of the late Mary W. Springer.

Wills Eye Hospital, $100,000; Episcopal Hospital, $100,000; Pennsylvania Hospital, $200,000; Burlington County (N. J.) Hospital, $25,000; Children's Hospital, $50,000; Philadelphia Home for Incurables, $50,000; West Philadelphia Hospital for Women, $50,000, and Kensington Hospital for Women, $100,000, by the will of the late Edward T. Dobbins.

University of Pennsylvania Hospital and the Chestnut Hill Home for Consumptives to share a trust fund of more than $100,000 for the endowment of free beds, by the will of the late Alfred Lewis Ward, Philadelphia.

Roman Catholic Orphan Asylum and New York Foundling Hospital, $10,000, and St. Vincent's Hospital, $20,000, by the will of the late Mr. Samuel Stern, New York.

Mercy Hospital, Fort Hamilton Hospital and the Children's Home, all of Hamilton, Ohio, each $1,000 from the estate of Sidney Stead.

A $200,000 hospital fund by the will of the late Mrs. Mary B. Hayner. It is to be known as the Charles C. Hayner Hospital Fund and is to provide free hospital service to the people of Troy, Ohio, and vicinity.

Flower Hospital, New York, $5,000, by the will of the late Jacob Henry Perkins, Madison, N. J.

Children's Hospital, Cincinnati, $5,000; Bethesda, Good Samaritan, Christ and Jewish hospitals, Cincinnati, each $2,500, and Miami Valley Hospital, Dayton, $2,500, by the will of Judge Runyan, Lebanon, Ohio.

Holy Family Hospital, Brooklyn, $35,000, by the will of the late Dr. James S. Waterman.

Hospital for Joint Diseases and the Montefiore Hospital, New York, each $5,000, by the will of the late Mrs. Mina S. Weaver.

Mount Sinai Hospital and Montefiore Hospital, New York, $7,500 and $1,000, respectively, by the will of the late Mrs. Selina E. Sommerfield.

W. A. Foote Memorial Hospital, Jackson, $30,000, by Mrs. W. A. Foote for a new surgical department.

Hospital for the Women of Maryland, $15,000 by the will of Mr. Francis A. White, Baltimore.

Medical Bills in Congress.—H. J. Res. 260, introduced by Representative Sirovich, New York, proposes to request the President to call a conference of the civilized nations of the world in Washington, in 1931, to solve the problem of narcotic addiction. H. R. 9932, introduced by Representative Knutson, Minnesota, proposes to authorize the President to commission as a major general in the medical department of the Army a colonel of the medical corps of the Army "Who has achieved distinction among the medical profession as a general surgeon and since the World War has contributed greatly to the development of surgery of the chest" and who has received the distinguished service medal. H. R. 10375, introduced by Representative Woodruff, Michigan, proposes to provide for the retirement of disabled nurses in the Navy. H. R. 10378, introduced by Representative Chindblom, Illinois, proposes to authorize an appropriation of $1,720,000 to erect an addition to veterans' hospital 105, at North Chicago, Illinois. H. R. 10381, introduced by Representative Johnson, South Dakota, proposes to amend the World War Veterans' Act to provide that, if an ex-service man had, prior to Jan. 1, 1925, a disability developing to a degree of 10 per cent or more, he shall be presumed to have acquired it in service. H. R. 10419, introduced by Representative Rogers, Massachusetts, proposes to authorize an appropriation of $87,500 to erect an addition to the veterans' hospital at Bedford, Massachusetts. H. R. 10449, introduced by Representative Arentz, Nevada, proposes to authorize an appropriation of $500,000 to erect a veterans' hospital in Nevada. H. R. 10452, introduced by Representative Sirovich, New York, and H. R. 10561, introduced by Representative Porter, Pennsylvania, propose to create in the Treasury Department a bureau of narcotics. H. R. 10463, introduced by Representative Goldsborough, Maryland, proposes to authorize an appropriation of $3,000,000 to erect an addition to the veterans' hospital at Perry Point, Maryland. H. R. 10574, introduced by Representative Goodwin, Minnesota, proposes to extend for a seven year period, from July 1, 1930, to June 30, 1937, the act of Nov. 23, 1921, entitled "An Act for the promotion of the welfare and hygiene of maternity and infancy, and for other purposes."

CANADA

Course in Museum Technic.—The Pathological Institute of McGill University, Montreal, is offering a two weeks' course in medical museum technic, June 9-June 21. It will be divided into ten one hour lecture and laboratory periods, and twenty sessions of two hours each for practical laboratory work. The course is open to those who have a working knowledge of gross anatomy either through academic training or previous practical museum work. Only eight persons can be admitted to this course. Early registration is desirable. A fee of $25 will be charged to cover actual laboratory expenditure. Further information may be had from E. L. Judah, curator of museums, McGill University, 3775 University Street, Montreal.

FOREIGN

Personal.—M. Charles Nicolle, head of the Pasteur Institute, Tunis, has been elected a member of the French Academy of Sciences; Dr. Nicolle was awarded a Nobel Prize in 1928. ——Dr. Gustav Bucky, New York, has succeeded the late Professor Levy-Dorn as director of the Roentgen Institute of the Rudolf Virchow Hospital, Berlin.

Graduate Course in Neurology and Psychiatry.—A six weeks graduate study in neurology and psychiatry in English will be held, June 23-July 31, under the auspices of the American Medical Association of Vienna, at Prof. Wagner von Jauregg's neuropsychiatric clinic. The fee is $150. Further information can be obtained from Docent Dr. E. Spiegel, Vienna, I., Falkestrasse 3.

Lectures at Royal College of Surgeons.—Dr. Carey F. Coombs will deliver the Lumleian lectures on syphilis of the heart and great vessels before the Royal College of Physicians of London, March 20, 25 and 27. The Oliver-Sharpey lectures on diabetes as a physiologic problem will be given by Dr. John J. R. Macleod, April 29 and May 1, and Sir Charles Martin will deliver the Croonian lectures on the thermal adjustment of man to external conditions, more particularly those pertaining to warm climates, June 12, 17 and 19. The concluding talk of the Goulstonian lectures on the significance to clinical medicine of studies in calcium and phosphorus metabolism will be given by Dr. Donald Hunter, March 18. These lectures, to which any member of the medical profession is admitted on presentation of a visiting card, will be delivered at the college, Pall Mall East, S.W.1, at 5 p. m., each day.

Society News.—The first Pan-Hellenic Health Conference will be held in Athens in April. The Greek Medical Association is arranging an exhibition relating to hygiene in general, to which it is hoped that a large number of exhibits from other countries will be sent. Such exhibits will be exempt from customs duties and should be sent before March 31 to the offices of the organizing committee of the conference, Odos Kriezotou I, Athens.

Government Services

Army Personals

Capt. Thomas W. E. Christmas will sail from San Francisco, about May 24, for the Panama Canal Department.——Major Rufus L. Holt will sail for the Philippine Department, about May 7.——Capt. Raymond C. Wolfe, having been found physically disqualified for the duties of a major in the medical corps by reason of disability incident to the service, his retirement by the President from active service as a major under the provisions of the act of Congress, approved April 23, 1908, is announced to date from Jan. 18, 1930.——First Lieut. William H. Powell, Jr., has been relieved from Fort Bragg, North Carolina, and assigned to duty at Fort Humphreys, Virginia. ——Major Charles E. MacDonald, medical corps, having been found by an army retiring board incapacitated for active service on account of disability incident thereto, and such finding having been approved by the President, his retirement is announced. ——Capt. Robert S. McKenzie will proceed to Hot Springs National Park, Arkansas, effective about March 15, and report to the Army and Navy General Hospital for duty and First Lieut. Stuart A. Cameron from New York about February 21 for Nicaragua.——Major Verner T. Scott has been assigned to duty at Walter Reed General Hospital, Army Medical Center, Washington, D. C.——Major James B. Owen is assigned to duty at Fort Riley, Kansas, effective on completion of his present tour of foreign service, in accordance with orders to be issued by the commanding general, Hawaiian Department.——Major Robert A. Allen has been assigned to duty at Fort Williams, Maine.——Col. Robert U. Patterson will sail from New York City about July 18 for the Hawaiian Department.——Col. Jere B. Clayton, having been found by an army retiring board incapacitated for active service on account of disability incident thereto, and such finding having been approved by the President, his retirement from active service is announced.——Major Brooke Dodson will proceed to Fort Benning, Georgia, and report to the commanding officer at that post for duty.——Major Larry B. McAffee will proceed to Carlisle Barracks, Pa., for duty, effective on completion of his present course of instruction at the Army War College, Washington, D. C.——Col. William J. L. Lyster will proceed to Hot Springs National Park, Arkansas, and assume command of the Army and Navy General Hospital about May 1.

Change of Station in the Navy

The following changes have been announced: Lieut. Comdr. Frederic L. Conklin to the navy hospital, New York, about April 20; Comdr. Gordon D. Hale to the Guardia Nacional, Nicaragua, about March 25; Lieut. James F. Finnegan to the navy station, Tutuila, Samoa, about April 1; Lieut. Comdr. Raymond B. Storch to the navy hospital, League Island, Philadelphia; Lieut. Comdr. Percy W. Dreifus to the receiving station, Hampton Roads, Va.; Lieut. Comdr. William W. Hargrave to the navy station, Tutuila, Samoa, effective about April 1; Lieut. Comdr. Harry W. B. Turner to the navy hospital, Washington, D. C.; Rear Admiral Albert M. D. McCormick, Capt. Charles N. Fiske and Lieut. Desse A. York have been ordered home; Lieut. Arthur H. Pierson from the navy hospital, Canacao, to the United States; Lieut. Hugo O. G. Wagner from the U. S. S. *Helena* to the United States; Lieut. Joseph B. Logue has been transferred to the receiving station, Hampton Roads, Va.; Lieut. Comdr. Robert B. Miller to the recruiting station, New York, and Lieut. John Q. Owsley to the navy dispensary, navy depot.

Examination for Entrance Into Public Health Service

Examination of candidates for commission as assistant surgeon in the regular corps of the U. S. Public Health Service will be held at the following places on May 5: Washington, D. C., Chicago, New Orleans, San Francisco and Stapleton, N. Y. Candidates must be 23 years and not over 32 years of age. They must have been graduated in medicine at a reputable medical college, and have had one year's hospital experience or two years' professional practice. They must satisfactorily pass oral, written and clinical tests before a board of medical officers and undergo a thorough physical examination. Requests for information or permission to take this examination should be addressed to the surgeon general, U. S. Public Health Service, Washington, D. C.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Feb. 22, 1930.

Teaching of Biology in Schools

A plea for a new method of teaching biology so as to make it less technical, bring out its intrinsic interest and use it as a "bridge" study in schools, thereby linking the humanities with science, was made by Prof. Julian Huxley in an address to the School Nature Study Union. His two main objects were to make biology a cultural and not merely a technical subject and to avoid teaching it as if the pupils were going to become specialists in advanced biology. With few exceptions it was not taught as English and history—because of its intrinsic interest—but as a preparation for a specialized career in medicine, agriculture and forestry. A biologic background should be part of the general thought in any civilized community. Biology was not specialized or remote in its origins or applications. It found application to such political questions as population, eugenics, personal and public health, sex problems and agriculture. It affected one's whole apprehension of other sciences, such as psychology and anthropology. It was necessary, if an intelligent interest was to be taken in the politics of the future. In one or two generations the question of the world population would be a major political question. One advantage of teaching biology was that the subject of sex could be introduced naturally without any false modesty as part of a general scientific course, and the sex problem was put in its place as a subordinate fact in the scheme of things. The idea of teaching subjects in water-tight compartments must be opposed. The narrowness of zoology, botany, and the old-fashioned chemistry and physics, which still inclined to the belief that what could not be handled in the laboratory and demonstrated in a test tube was not physics or chemistry, must be abandoned. There has been the feeling that soil chemistry is not really chemistry, and colloids had suffered in the same way. The most difficult and in some ways the most interesting problems of the future would lie in the physics and chemistry of living substances. By following the phenomena of life from their beginning up to the higher animals, a bridge between inert matter and sentient man might be discovered. The humanities must be taught so that children realized that there was a scientific side to life. The ideal to be set before teachers was scientific humanism, giving children an idea of life based on the understanding of the best in human nature, with in the background the attempt to control environment by scientific methods. At a later stage, big and difficult theories such as evolution could be introduced, or heredity and animal behavior could be dealt with and instinct and adaptability examined. There was much misapprehension with regard to animal behavior. The ideas that animals were the simplest type of reflex machines, or that they were little human beings with the same thoughts and feelings as ourselves, were completely wrong. The great generalization of physics, that the universe was running down, and of biology, that life was progressive, should be given to the growing mind. If the running down eventually destroyed the progress, that would be a long time ahead.

The Storage of Fruit

Experiments by S. A. Trout of the low temperature research station of Cambridge have broken new ground with regard to the storage of fruit. We have been taught that fruits are living organisms, inhaling oxygen and exhaling carbon dioxide, like animals, and we are apt to think that they require the presence of oxygen. But Mr. Trout has found that in the absence of oxygen it is possible to extend the storage life of fruit 50 per cent. Temperatures must not be too high and more

than 10 per cent of carbon dioxide in the atmosphere must be avoided. The experiments were made by storing early maturing pears in atmospheres containing nitrogen and carbon dioxide in proportions of 95 and 5 per cent, 90 and 10 per cent, and 85 and 15 per cent, respectively, at temperatures of 3, 10 and 18 C. At all these temperatures, harmful results followed when the percentage of carbon dioxide exceeded 10. The exposures to oxygen-free atmospheres containing less than 10 per cent of carbon dioxide delayed ripening and prolonged the storage life of the fruit. The best results were obtained by storing pears for twenty-one days at 3 C. in an oxygen-free atmosphere containing less than 10 per cent of carbon dioxide. These pears ripened two weeks later than those stored in air. In another series of experiments, pears were stored in an atmosphere of nitrogen from which the carbon dioxide formed by the fruit was removed by soda-lime. The results were successful.

Increase in Suicide with Coal Gas

The report of the departmental committee appointed by the board of trade to consider the increase during recent years in the number of deaths ascribed to poisoning by coal gas supplied for domestic purposes and to make recommendations with a view to their reduction has been published. Deaths in 1918 due to accident are given officially as 102; due to suicide, 193; total, 295. In 1928 the figures are: accident, 168; suicide, 1,191; total, 1,359. In some of the cases recorded as accident there was a great likelihood of suicide. This is borne out by the fact that of 1,026 deaths from gas poisoning specially investigated by the board of trade during the last eight years no fewer than 692 were found to be due to gas burners left open, in many cases without adequate reason. A curious fact is that the Great War during its continuance had the effect of checking all forms of suicide. While the suicide rate from all causes has returned to its prewar level, nearly all the increase from the low war level has taken the form of coal gas poisoning. In the past, drowning was the most common cause; but gas poisoning now heads the list. This is ascribed to the publicity given to cases of gas poisoning, which has led to imitation. Similarly, suicides due to taking acetylsalicylic acid and compound solution of cresol increased after publication of instances, notwithstanding that death from compound solution of cresol is agonizing. The committee took pains to ascertain whether the accessibility of gas causes persons to commit suicide who would not otherwise have done so. But Sir Maurice Craig (psychiatrist) gave evidence that the will to die is the primary matter and that the mode selected is either what appeals to the individual or some means recently reported in the press. There is an indication, however, that the rate of suicide among females has increased considerably above its highest level before the war and that the increase is entirely in the form of coal gas deaths. It would seem therefore that, although the use of gas as a means of suicide is largely a change of fashion and although there may be other factors contributing to an increased suicide rate among females, the nonrepellant circumstances attending the use of gas and its accessibility influence some persons, especially females, to commit suicide who otherwise would not have done so. In his evidence, Sir Maurice Craig laid stress on the importance of the early treatment of mental disorder as the only means by which people with a tendency to commit suicide can be helped. In his view, many who commit suicide are not insane but do so from a fear of becoming insane.

The committee draws the following conclusions: 1. While the deaths by suicide from coal gas poisoning have shown a great increase, accidental deaths have shown, on the whole, no appreciable increase and remain at a figure that affords no cause for alarm. 2. The increased gas suicides denote merely a change of method. 3. The extraction of carbon monoxide from coal gas is not practicable at the present time and to prohibit the new process which increases the quantity of carbon monoxide would be of no use, as suicide can be easily committed with ordinary coal gas. Among recommendations made are the following: 1. A series of experiments on the lines suggested by Dr. Haldane should be carried out with a view to obtaining accurate information as to the toxicity of gas should it escape from the pipes and fittings. 2. A central body should be formed for research into a means of rendering gas nontoxic and of improving the safety of apparatus. 3. Gas companies that have not already done so should establish voluntary inspection of consumers' apparatus to detect badly adjusted and ill ventilated apparatus. 4. When a hole is made under the ground through the wall of a building, the aperture should be stopped to prevent passage of gas into the building. It should be unlawful to maintain a geyser without a proper flue.

House of Commons Considers Mental Treatment Bill

In the house of commons Mr. Greenwood, minister of health, moved the second reading of the mental treatment bill, which has already passed through the house of lords. He referred to the unfortunate position of persons wandering in "no man's land" between sanity and insanity and of persons temporarily deranged who, through lack of early or adequate care, were plunged into permanent insanity. The bill sought to carry into law the report of the royal commission on lunacy, appointed five years ago, which emphasized the need of a new conception of mental disorder and its treatment—that it should be viewed much in the same way as physical disease and treated early. The bill provides for two classes of persons—those who recognize the instability of their condition and the desirability of taking early preventive measures, and those no longer able to do this but who may be curable and ought to receive different treatment from that of a certified lunatic. At present, voluntary boarders can be received only in certain institutions, in licensed houses and hospitals registered under the lunacy act, and only in two public institutions, where, as a result of special legislation, voluntary boarders can be accommodated—the Maudsley Hospital and the London Mental Hospital. With few exceptions, treatment of voluntary boarders is available only for people able to pay for it. Most of the public hospitals are not entitled to take in voluntary boarders. The result is that many for whom such treatment is desirable cannot receive it. Of 115,000 places in our mental institutions, none are available for persons who want to go in in the first stage. They are used only for persons certified by physicians as insane. The bill makes more extended provision for the voluntary boarders and provides that they may be taken into institutions now closed to them. If a person voluntarily enters an institution for treatment, he cannot be permitted to leave exactly when he likes. The law now requires twenty-four hours' notice; in the bill this period is extended to seventy-two hours. This gives sufficient time to communicate with the patient's friends so that arrangements for care on release can be made. At present the moment that a person's mind becomes temporarily unhinged he is liable to be branded with the stigma of certification, which keeps from proper institutional treatment many who would benefit from it. The bill provides that such persons shall be subjected to a period of treatment not exceeding six months, after which the treatment may be continued for another period not exceeding six months. In getting rid of certification for the nonvolitional cases, the commission proposed "with reluctance" that the order should be signed by a magistrate. The government, however, concluded that to the ordinary mind this process would not be distinguishable from certification and therefore rejected it. In its place it was necessary to provide safeguards. There must be two medical recommendations to support the application on behalf of the nonvolitional patient, one signed by a physician specially appointed by the state, the other, if practicable, by the patient's usual physician. A further safeguard is that these persons can go only into institutions under a measure of public control, subject to frequent official

visitations. A patient must in any case be discharged within twenty-eight days of recovery of volition. The object is to protect the patient and at the same time avoid the stigma of certification.

PARIS

(From Our Regular Correspondent)

Feb. 5, 1930.

Decrease in Mortality Among Abandoned Children

The general council of the Department of the Seine listened recently to the report of Mr. Rebeillard on the service of the children abandoned by their parents and turned over to the care of the Assistance publique. The number of these wards amounts to 27,000. The Assistance publique has made great efforts to diminish the mortality among these children, especially among those placed in families in the rural districts, where the mortality ranged from 20 to 50 per cent. In the department of the Seine, in spite of the necessity of feeding the children on an artificial diet, results were secured that the minister of health refers to as magnificent. From 1918 to 1923 the average mortality ranged from 30 to 40 per cent; in 1924 it was 18 per cent; in 1925, 16 per cent; in 1926, 15 per cent, and today it is only 6.10 per cent. The most interesting principle of the method employed consists in having the abandoned children spend a few weeks in a special establishment, in which they are carefully supervised by pediatricians, before being sent out to the peasant families in the country. The children are not subjected to this experience until they are in excellent health.

Pettit's Work on the Spirochetes

Under the title "Contribution à l'étude des Spirochêtidés," Dr. Auguste Pettit, professor at the Institut Pasteur and member of the Academy of Medicine, has completed a voluminous work of great interest, in which he outlines his researches on the spirochetes, incorporating therewith the results of the investigations of the physicians and microbiologists of the old and new worlds. This work furnishes a good example of the rapidity with which a new chapter in science develops nowadays. The first spirochete was described in 1890, and within the next few years not many were added. Today, the known species have reached several hundred, and more than 260 pages is required to give even a condensed account of them. The reader will become familiar with the biology of these hundreds of micro-organisms that infest the soil, the waters, the bodies of most animals, and even man himself in health and disease. The author calls attention especially to the characteristic structure of the spirochetes, which is that of a helix, in the geometric sense of the word, and not that of a spiral, as a number of authors have stated, owing to an inexcusable confusion of terms. The helix has been overlooked by many observers but it is undeniable. Pettit supplies the proof by means of cinematogravures taken of the living micro-organism. Heretofore, morphology has been unable to differentiate the species. Obviously it is necessary, with regard to each taxonomic species, to describe the helix after the manner of geometricians and determine its numerical elements. But if the body of the spirochete constitutes a helix, it is necessary to determine the direction of the whirl. The spirochetes examined by Pettit have the whirl to the right. He expresses the view that progress cannot be made in the classification without adopting universally the Key Catalogue of the United States Hygienic Laboratory, prepared by C. W. Stiles and A. Hassal.

Hemorrhagic spirochetosis constitutes the sole subject of the third part of the work, which gives a thorough treatment of the biology and the clinical aspects of a disorder that has become so frequent. In this part, the author has a series of photomicrographs and a few magnificent color photographs. He reports a number of observations made in the United States with regard to the transmission of spirochetosis. Pettit has made some new observations on icterohemorrhagic spirochetosis, the most prominent of which is the serodiagnosis of this condition. His laboratory at the Institut Pasteur has done every week since 1916 the serodiagnosis of icterohemorrhagic spirochetosis. The results of serodiagnosis have been corroborated by the clinical examination. Pettit's laboratory is consulted not only by France but also by other countries. For more than twenty years after the infection, the serodiagnosis is positive. The serodiagnosis is carried out with serums taken several months before the examination and coming from the most distant points of the globe. Pettit's work ends with a discussion of technic, a bibliography that includes recent publications in the United States, and tables. Pettit is an authority in the field of microbiology. His general presentation will serve as a basis for research in the coming years.

Modification of the Aschheim-Zondek Test

The research of Brouha, Hinglais and Simonnet, presented to the Academy of Medicine by Professor Bar, appears to have brought the biologic diagnosis of pregnancy a step forward by the modification of the test proposed by Aschheim and Zondek. The original test comprised the injection of the urine of a woman supposedly pregnant into young female virgin mice; if the woman is actually pregnant, the genital organs of the mice take on immediately a remarkable development. This test is subject to error, because the urine of the pregnant woman contains, at the same time, a hormone coming from the anterior lobe of the hypophysis and a folliculin. The folliculin may be found also in the urine of nonpregnant women, as the result of certain menstrual disorders. Under these conditions the Aschheim and Zondek test is subject to a 40 per cent element of error. Brouha and his collaborators have eliminated this source of error by using, in place of female mice, young male mice, which do not react to the folliculin but do remain sensitive to the hormone of the anterior lobe of the hypophysis. If the urine injected is derived from a woman really pregnant, the genital organs of young male mice present a development from four to twelve times greater than in the mice used as controls. Applying these facts to the clinic, the authors stated that, of 150 controlled cases at the Tarnier clinic, 100 per cent of correct biologic diagnoses were secured. The injection of urine of a pregnant woman into male mice appears therefore to be a test of great value in the diagnosis of early and uncertain pregnancy. The authors call attention to clinical and physiologic facts that explain their observations. They show how prompt is the action, in the pregnant woman, of the antehypophyseal hormone and how intense it is. A similar precocity is observed in all animals, but the intensity is particularly marked in woman and in the primates. This intensity, taken in addition to other well known facts, makes more intelligible the pathologic disorders observed at the beginning of pregnancy.

Increase in Number of Physicians in France

The difficulties of the medical profession, which the new law pertaining to social insurance is going to increase, are due, to some extent, to the increasing number of diplomas granted by the faculties of medicine. The graduates, instead of spreading out over the country, are settling in the large cities. A large number of them are foreigners who are establishing themselves in France. There are in this country more physicians than the population can support. The number enrolling for the first examination in 1922 was 1,369; in 1923, 1,398; 1924, 1,682; 1925, 1,900; 1926, 2,211; 1927, 2,414, and 1928, 2,991.

In the department of the Seine alone there were in 1893 2,208 physicians. Today there are 5,530, for a population that has not increased in the same proportion. For the whole of France, the number of physicians has increased from 16,815 in 1900 to 27,500 in 1928, whereas the population has been augmented by only two million inhabitants, passing from 38,442,601

to 40,743,000. In 1913 there was one physician for 2,300 inhabitants, while in 1928 there was a physician for each 1,400 inhabitants.

No less surprising is the increase in the number of foreign physicians. No other country has such a proportion. At the first enrolment in 1928, of 2,991 enrolled, 684 were foreigners, seventy-nine of whom were women, or one foreigner for each four or five Frenchmen. One finds the same proportion in comparing the diplomas granted at Paris: In 1924-1925, 533 Frenchmen and 302 foreigners received diplomas; in 1925-1926, 561 Frenchmen and 237 foreigners, and in 1926-1927, 606 Frenchmen and 297 foreigners.

In 1927, ninety-six university diplomas were transformed into state diplomas, whereas, before the war, the number of diplomas transformed amounted only to from twenty-five to thirty annually. It is therefore certain that more than a thousand foreign or naturalized physicians are practicing in France, and that the number will soon exceed two thousand if the government continues to accord the opportunity of transforming into state diplomas foreign doctor's diplomas and French university doctor's diplomas.

JAPAN

(From Our Regular Correspondent)

Feb. 5, 1930.

Institute for Infectious Diseases

The regular meeting of the Kitasato Institute for Infectious Diseases was held in the institute at Tokyo, Dec. 7, 1929, and the second session on the 14th of the same month. Papers were read as follows: on the morphologic studies of soya sauce intoxication, by Dr. Kawakubo; on the artificial cultivation of the intima cells of the aorta, by Dr. Shibuya; on the passage of the virus of mumps and Tsutsugamushi disease through the testes of the rabbit, by Dr. Takube; on general syphilis of the rabbit, by Dr. Amaya; on colloidum membrane dialyzation, by Dr. Watanabe; on the blood sugar contents of rabbits inoculated with rabies virus (fixed virus), by Drs. Takube and Okamoto; on differences of susceptibility to typhoid, by Drs. Yamaguchi and Matsuda; on the relation between the passage of tuberculosis bacilli through the skin and immunization, by Dr. Ono, and on the immunization of tuberculosis by Drs. Okamoto and Tanaka.

Some Opinions on Birth Control

In its New Year's issue the *Ikai-jiho*, a medical magazine in Tokyo, published the opinions of several distinguished men of medicine whom the editor had asked to state their position with regard to practicing birth control in Japan from the sociopolitical point of view.

Mr. Kato, sanitary officer in the Metropolitan Police, said that the practice of birth control should not be treated as a problem of social policy in our country at the present time, though there is much to be considered concerning the problem of population as well as of economy.

Prof. Dr. Toda, professor in the Kyoto Imperial University, said that the prevention of early marriages in our country is preferable to the artificial control of births by the married.

Mr. Furuse, expert in the social bureau of the interior department, said that such propaganda would be apt to be effective only among the rich or intellectual classes and is not practical among the poor or ignorant classes, whose fecundity needs checking.

Dr. Takano, chief of the preventive section of the sanitary bureau of the interior department, said that only the poor who find it difficult to earn a livelihood with a large family to support should have the benefit of a doctor's skilled advice in this matter.

Dr. Terutoshi, chief of the Kurashiki Institute for Labor Sciences, said that this is one of the last means to be taken as a social policy, and that much depends on the character and conscientiousness of physicians.

Prof. Dr. Ono, professor in the Hokkaido Imperial University, said that it is too early to practice birth control in our country, and that the general practice is a chronic disease as ruinous to a nation as the acute disease of nihilism.

Dr. Jin, chief of the Physicians' Association of Aomori Prefecture, does not think it so pressing a problem in the present state of things in our country.

Dr. Segawa, chief of the Segawa Hospital, said that in order to save the poor from being starved to death, it is quite an avoidable means, but, as to the methods of birth control, much should be considered.

Dr. Hirose, chief of the infant section of the Tokyo Social Bureau, said that birth control is one of the best means to attain prosperity, though it should be investigated scientifically further.

Dr. Oishi, chief of the Nakazu Hospital, Tokyo, offers no objection, provided the methods as well as the limits of the practice be inquired into carefully by the local committee.

Dr. Ujihara, medical expert in the interior department, favors birth control from the point of view of eugenics; he has investigated the problem as regards sterilization, but much remains to be done if it is to be adopted in the present state of things in our country.

Dr. Kubo, vice chief of St. Luke's International Hospital, regards this as a problem to be discussed in private, and not in public, especially by nonprofessional persons; he is afraid that many persons who do not really need it would be misled.

Dr. Miyajima said that birth control would lead our race to suicide rather than save it, and that we should make efforts not to prevent the increase of population but to increase the national knowledge of science.

Prof. Dr. Asada, professor in the Nasaki Imperial Medical College, said that the regulations under which birth control might be practiced must be settled first of all, such as: (*a*) the mother's weak health; (*b*) the presence already of more than four children; (*c*) a small family income.

The Empress and the Charity Hospital

Dec. 16, 1929, the inpatients of the Saiseikai Charity Hosnital were given kimonos by the empress.

MADRID

(From Our Regular Correspondent)

Feb. 8, 1930.

Treatment of Acute Anterior Poliomyelitis

Several lectures have been delivered on the treatment of acute anterior poliomyelitis. An epidemic was recently confirmed by the sanitary authorities and then declared by the same authorities as having disappeared. Dr. Arce, radiologist at the Hospital del Niño Jesús, in a lecture at the hospital, stated that until 1921 electrotherapy was used in the regressive period of paralysis. The principal therapeutic action of electrotherapy was on the peripheral nerves and muscles. As the principal lesion of acute anterior poliomyelitis is in the medulla, electrotherapy did not give good results. The speaker since 1925 has used successfully Bordier's method, which consists in a combined treatment of radiotherapy, diathermy and electrotherapy. Radiotherapy is given to several areas of the medulla according to the localization of the paralysis. Bordier said that roentgen rays check the sclerosis and atrophy which are destroying the nervous cells in the foci of myelitis but that the improvement is caused by an indirect effect of the rays on the pericellular infiltration. Irradiation also makes the inflammatory phenomena diminish until resolution, whereas, when the disease is neglected, the inflammation increases with formation of exudate, which finally damages or destroys a large number of nervous elements. Irradiation also helps in restoring the nerve cells, which are not definitely atrophied.

Diathermy is given on the limbs in order to avoid or correct vasomotor or trophic disturbances. Diathermy will prevent delay of development of the affected side of the child. Electrotherapy is used in the forms of galvanization, sinusoidal voltaization and faradization; it should be resorted to when muscular atrophy or hypotony is present.

Trip to the Spas in Spain

A trip of about 932 miles was organized by the Committee of Organization of Trips. The party included 110 physicians and their families, from Spain, France, Italy and Belgium, who visited several spas in Spain. Dr. Hernando, professor of therapeutics in the Faculty of Medicine of Madrid, was the guide. Before starting, he lectured at San Sebastián, describing the character of the springs to which they were going. Dr. Marañón lectured in Bilbao on crenotherapy in the treatment of dyscrasia. Dr. Rodríguez Pinilla, instructor of hydrology of the Faculty of Medicine of Madrid, spoke on the geology of the waters of northern Spain and the use of these waters in the treatment of disease. Dr. Decref of Rioja spoke on the nutrient value and tonic virtues of wine. He noted that in Spain, which produces and consumes much wine, drunkenness is almost unknown. In such large cities as Madrid or Barcelona, months pass without a drunkard being seen on the streets. He who has seen drunkenness in London or Hamburg is surprised at the lack of it in Spain. In Cestona, the ex-minister, Dr. Conde de Gimeno, spoke on the waters of the balneary of which he is the head. The heads of several other balnearies did the same. In Spain there is an official organization of the balnearies. It is compulsory that every balneary have an official head physician, and the position is obtained by a system of promotion, similar to that of the army. The balnearies of Spain are half a century behind other European balnearies, in spite of their natural good quality. The springs of Archena have no rival in the world for their content of mercuric and bismuth substances. There are the waters of Panticosa for the treatment of tuberculosis, the waters of Cestona for the treatment of biliary calculus, those of Marmolejo for urinary calculus, those of Mondariz for disturbances of nutrition and for arthritism, and those of Alanje for the treatment of neurosis. There are springs such as the Hervideros de Fuentesana (bubbling springs), where the production of carbonic acid is so intense that the persons who take baths there must be careful in order that the bubbles do not throw them to the surface of the water or to the shore of the spring. The balnearies are deficient in equipment and they are inconvenient. Last year the public stayed away. The owners blamed the physicians of San Sebastián, but when the owners recognize their responsibility to the public and that they have to keep pace with the rest of the world, their balnearies will be successful.

Professor Maestre Retires

Dr. Maestre, instructor of legal medicine of the Faculty of Medicine of Madrid, has been retired from duty, having reached the age limit. He held a prominent position for many years. Dr. Maestre left the general hospital of Murcia and came to Madrid. Ten years later he was made professor of legal medicine of the Faculty of Medicine of Madrid. He secured some donations for his private laboratory, which enabled him to make it a teaching center. His greatest satisfaction as a forensic physician has been to prove the innocence of the defendants, even if sentenced to death. Dr. Maestre made it his duty to free from jail every one he could. One of the important papers he wrote related to a report on Mariana de Jesús, whose body was disinterred after three centuries without having been decomposed. Dr. Maestre found that Pasteur's *Vibrion septique* prevented decomposition. Four years ago, three Madrilenian girls disappeared. The police could not find them. One of the girls had 35 cents when she disappeared. Last year, some human bones were found in a precipice, and Dr. Maestre wrote a voluminous report to prove they were those of the girls, as well as the 35 cents which he asserted was found with the bones. Unfortunately for his case, more than twice 35 cents was found about the bones, so the judge did not agree with his report.

Epidemic of Trichinosis

An epidemic of trichinosis in which more than seventy persons were sick and five died was recently reported from Almaden de la Plata. The department of public health, which claims that the epidemic is under control, said that it was caused by the carelessness of municipal employees, who had placed the veterinary service under the charge of a simple horse-shoer. At the request of public health authorities the minister of the interior punished the municipal employees and fined the veterinary of a near town who acted as a temporary municipal physician. The municipal employees of Sancelle were also punished because they permitted the sale of infested pork. The inspector of another stockyard was dismissed and fined because his inspection was deficient, allowing meat infected with trichina to be accepted at the stockyard. Fortunately this was discovered before the meat was consumed.

Tuberculosis Sanatorium in Bilbao

Bilbao has had several donations for antituberculosis work. Mr. Francisco Ledo organized the "Fiestas de la Flor" (annual tag day) and with the funds collected a beautiful dispensary was built, in which more than 15,000 patients have been treated. While plans were under way to enlarge the dispensary and to build a sanatorium in the suburbs of Bilbao, Mr. Luis Briñas donated a site in Monte Abril, and a check of 126,000 pesetas ($25,200). He has increased his gifts to a total of 2,500,000 pesetas ($500,000) to the Victoria Eugenia Sanatorium for tuberculous patients in Bilbao.

Deaths

Dr. Jaime Ferrán y Cluà, who died recently in Barcelona, was a modest physician of Cataluña. He started in his own home to study bacteriology. During an epidemic of cholera in 1885 he prepared a vaccine against cholera, for the first time with attenuated living micro-organisms. Opinions of Ferrán's work varied. It could not be judged with impartiality, as is the case frequently in Spain, because the scientific point of view is neglected and it is the personality of the author that counts. So there was a campaign in favor and against Ferrán. Ferrán had genius, which he applied to bacteriology. The European scientists recognized his work on vaccine against typhoid, on rabies and on diphtheria and on the changes in tubercle bacilli. Only in his own country the profession cannot hear Ferrán's name without comment; some worship him; others do not. Dr. Ferrán never accepted official positions. He was a bacteriologist and never taught at the universities. Since the professors are not enthusiastic for research work, they are not interested in the work of Ferrán.

Dr. Espina y Capo, well known Spanish phthisiologist and physician of the Hospital General of Madrid, has died, aged 80. Dr. Espina y Capo was the first that introduced roentgenography, radiology, cardiology and electrocardiology in Spain. His book "Mi Paso por la Vida" is interesting to those who want to know Spain during the last part of the last century.

Dr. Augusto Priò, radiologist of Cataluña, died in Barcelona from lesions caused by roentgen rays. In 1895, while a student, he began research as a radiologist. Some years later he was appointed assistant professor of the Faculty of Medicine of Cataluña.

Dr. Pedro Aznar, bacteriologist of the Hospital del Rey, died of malta fever, which he contracted while doing research. Dr. Aznar, after graduating in medicine, devoted himself to bacteriology in the Instituto de Higiene de Alfonso XIII. He obtained a scholarship to do research in other countries, and

worked two years under Weinberg at the Institut Pasteur in Paris. On returning, he obtained the professorship of serology of the Instituto Técnico de Comprobación. Later he was appointed head of the laboratory of the hospital of Cienpozuelos and had a position at the dermatologic laboratory of the Faculty of Medicine and at the Hospital del Rey. His most important books are "La Bacteriología de la Coqueluche," "El Cultivo del Espirocheta de la Fiebre Recurrente," and "La Flora Anaerobia de las Heridas por Astas de Toro." He published some books with Weinberg and many papers in foreign medical periodicals.

Woman Appointed Municipal Physician

Dr. Concepción Criado, a graduate of the Faculty of Medicine of Valency, is the first woman who has been appointed to be a municipal physician in Chiribella.

BUDAPEST

(From Our Regular Correspondent)

Feb. 3, 1930.

Aphrodisiacs Denounced

According to Dr. Buchler of Budapest, impotence may be caused either by a severe pathologic lesion of the cerebral cortex or of the genitospinal center of the spinal cord or by the genital organs. None of these pathologic changes can be influenced, in any way, by aphrodisiacs. In those cases in which impotence is caused by fright, aphrodisiacs act suggestively only and their value is no more than the suggestive power of the physician ordering them.

Experimental Cancer Research

At a recent meeting of the Budapest Interhospital Association, Dr. I. Bezi said that experimental investigations showed that in certain animals real malignant tumors may be produced with various external agents and that this proves the correctness of those clinical observations which led to the establishing of Virchow's theory. From morphologic studies of the histogenesis of experimental cancer, the moment when cancerous degeneration begins cannot be determined. The most diverse stimuli—mechanical causes, radiant energy, and chemicals—have the same effect. Irritation is only one factor in the great question of etiology. Without the assumption of an hereditary or congenital tendency, these phenomena cannot be explained. The tendencies of animals cannot be changed so that the experiments yield universal results. The final cause which transforms the cells of the animal into tumor cells cannot be explained as yet by experimental irritation tumors. Whether the irritation acts directly on the formation center, as proposed by Virchow, or the transformation into a tumor is brought on in a roundabout way in consequence of the disturbance of physiologic connections, is still a question.

According to the researches of Warburg, the tumor problem is mainly a metabolism problem. Cancer, in contrast with normal tissues, may gain the energy necessary to life through another reaction. Fermentation, for example, splits grape sugar into lactic acid. If respiration and fermentation are interrupted for four hours, the main mass of tumor cells perishes, in vitro. The investigations of Warburg, if true, are of fundamental importance. His conclusions, according to Herxheimer, fit into the frame of cellular pathology. The discovery of the specific metabolism of tumor cells is in accordance with the present conception of pathologists. What causes the metabolic changes of the cells is an open question. It would be extremely important to find out in what stage of tumor formation this metabolic change takes place, whether prior to the first appearance of cancer, contemporarily with it or subsequent to it. From this point of view, tar cancer ought to be observed from phase to phase.

It would be wrong, however, to refer the conclusions arrived at from experimental tumor research directly to man. Tandeloo says that the evolution of human tumors will be revealed only after the most thorough investigation of tumors of man. Besides the irritational factors, other circumstances are of importance.

Treatment of Industrial Eczemas

It is generally known that chemical substances used in industry and other mechanical irritants may harm the human skin. Herxheimer enumerates seventy-four branches of industry in which eczema may arise. Industrial eczema may be classed among the allergic skin diseases. In many cases other factors are contributory: organic disease, excessive consumption of spices and alcoholism. Desensitization through the use of specific external treatment seems improbable. Dr. Czibor of Budapest University used such substances as turpentine and milk on twenty-five patients. He experimented with the employment of internal parenteral desensitization methods. In fourteen cases the method was quite successful. According to Czibor, we ought not to stick to a single desensitizing agent. If the patient shows no improvement after the serial administration of eight or ten injections, other methods should be employed. He had to change the desensitizing agent in fourteen patients. If the patient gets debilitated during the application of milk, for example, or is otherwise weak, the agent that is used has to be changed.

Professor Wenkebach's Lecture

January 25, the Royal Medical Society had an illustrious guest in the person of professor Wenkebach of Vienna, who in his lecture reviewed the conception of the galenic school regarding the circulation, which, up to Harvey's discovery, seemed unshakable. According to Galen, the blood, which circulated in the veins, was prepared by the liver from the nutritional juices of the stomach, and was absorbed by the parts of the body. The blood was conveyed through the organism by the arteries. The air contained in the arteries served the purpose of cooling. Servetus, Vesalius, Cesalpinus and the teaching master of Harvey, Fabricius, had already guessed the existence of capillaries. Harvey settled by experiment that there is only one kind of blood in the organism and that it is driven into the arteries by the heart and brought back by the veins, and that the circulation is continuous and complete. After the lecture the Harvey film, prepared for the Royal College of Physicians, London, for the tercentenary jubilee of Harvey's discovery, was exhibited.

BERLIN

(From Our Regular Correspondent)

Feb. 1, 1930.

The Recording of Statistics on Disease

In place of the detailed blanks heretofore in use for recording disease statistics, certain leagues of Rhenish *krankenkassen*, taking account of the inaccuracies of medical diagnosis and the use of deceptive terms on the sickness certificates, have adopted the following form or schedule. Dr. Teleky, an industrial physician of the Rhine Province, publishes a report on the new form in a recent number of the *Deutsche medizinische Wochenschrift:* 1. General conditions of exhaustion: anemia, chlorosis. 2. Tuberculosis and suspected tuberculosis. 3. Syphilis. 4. Gonorrhea, chancroid, bubo. 5. Influenza. 6. Other infectious diseases. 7. Neoformations (benign and malignant tumors). 8. Diseases of the nervous system. 9. Diseases of the respiratory organs. 10. Diseases of the heart and the arteries. 11. Gastric, intestinal and hepatic diseases. 12. Uterine hemorrhages and miscarriages. 13. Diseases of the urinary and generative organs. 14. Skin diseases. 15. Muscular and articular rheumatism, gout. 16. Other diseases of motor organs. 17. Diseases of the ears (without injuries). 18. Diseases of the eyes (without injuries). 19. Injuries; other external effects (other than 20) and their sequels, including wound infection. 20. Industrial poisonings. 21. Other diseases and uncertain diagnoses.

In addition to this schedule with twenty-one groups of diseases and the industries schedule with twenty different groups of industries, the leagues of Rhenish *krankenkassen* established the fundamental features of the statistics to be collected and prepared the necessary helps: printed information, an alphabetical list of industries, and an alphabetical list of diseases, with instructions as to which group each industry and each disease belongs. They recommended to the affiliated *krankenkassen* to record disease statistics according to this schedule. This is the first and the only attempt made in Germany to induce a larger number of *krankenkassen* to work out and report their disease statistics according to a uniform schedule.

At present there are nineteen local *krankenkassen* and twenty-nine industrial *krankenkassen*, with a total of 687,832 members, that are keeping their statistics according to the described schedules. These include not only *krankenkassen* of the Rhine Province but also large *krankenkassen* outside the Rhine Province and Westphalia; for example, those of Heidelberg and Dresden. The first report covering the results of the first five years (1922-1926), since the introduction of the uniform schedules, has now appeared.

The age distribution of the male members of the various *krankenkassen* and, still more, of the various industrial groups varies greatly. In the smelting industry and other so-called heavy industries, the number of workmen under 20 years of age is small (9.5 per cent); also, the percentage of old men is small. The number of young persons in the commercial industries is large (30.1 per cent). On the other hand, the textile industry is distinguished by the fact that from 20 to 25 per cent of the workmen are more than 50 years old. The age distribution of females is quite different from that of males; for almost 75 per cent of the women gainfully employed are under 30 years of age, as compared with scarcely 50 per cent of the men. Only 13.17 per cent of the women are more than 40 years old, as against 31.8 per cent of the men. But this difference in age distribution between male and female workers is not so pronounced in all occupations; for instance, in the textile industry the age distribution of the female workers is about the same as that of the males. Also in the administrative service there is not a great deal of difference. These facts furnish evidence that, whereas female participation in industrial work signifies younger persons in most industries, in the textile industry and, to a certain extent, in administrative offices, the work done by women constitutes their life occupation. It may be mentioned also that, in recent years, in Berlin, in the groups termed "free occupations" and "clothing industries," the women members of the *krankenkassen* present about the same age distribution as the men, so that in Berlin these callings and, in part, also the commercial industry have become the life occupations of the women.

As for the incidence of disease, it must be remembered that not pathologic conditions in the medical sense but merely notifications of illness are recorded. The notification of illness is, however, dependent on a number of circumstances other than the bodily condition; for example, loss of employment or threatened loss of employment; on the other hand, the fear of losing one's position if one "reports sick," the amount of the difference between the actual earnings from labor and the cash benefits received during illness; then, too, the special conditions prevailing in a given *krankenkasse:* the attitude of the physicians toward the *krankenkasse*, the working of the control system, and other things of a similar nature. That explains why in various *krankenkassen* there is a widely different incidence of disease. In the Rhine Province it ranges among the male members of the local *krankenkassen* between 37.7 per cent in Remscheid and 75.9 per cent in the Cologne region. Likewise, in comparing branches of the same industry with one another, similar differences may be noted. Thus, the frequency of sickness among the metal workers of Koblenz is 40.92 per cent; in the Cologne region, 78.4 per cent; among the textile workers in Aachen, 30.4 per cent; in the Cologne region, 54.4 per cent. Among the *krankenkassen* of the heavy industries the same marked differences exist. The incidence of disease ranges between 18.5 and 56.4 per cent and, among the workers in metal, between 21.04 and 94.5 per cent. The effects of economic conditions vary also from year to year, since the labor market is subject to variations.

Considering the occupations represented in the individual *krankenkassen*, in practically all branches of industrial labor the frequency of sickness among the women is much greater than among the men. The building trade constitutes an exception, but the female members of the *krankenkassen* do no construction work. The conditions in the administrative services, the hotel industry and the commercial industries vary greatly. Among the women, of especial frequency are the conditions characterized by weakness and exhaustion, anemia and chlorosis, disorders of the generative organs, and tuberculosis. The curve representing the relative frequency of sickness in the various age groups varies greatly in the two sexes. Among the men, one observes, from the youngest age groups on (20-30), a gradual lowering of the frequency of sickness, which continues up to the ages 40 to 50, after which there is a rapid increase. With the women it is quite different, and one observes the greatest frequency of sickness between the ages 20 and 40, after which a rapid decline is noted. The frequency of sickness in women is closely connected with their sexual functions.

In the frequency of sickness of the various occupations, one can distinguish three principal groups, if the chief consideration is given to the male members of the *krankenkassen*. From the standpoint of health, the most favored occupations are: the art industry, including workmen engaged in various multiplication processes, although, in spite of the low frequency of sickness, tuberculosis and nervous diseases are widely prevalent; the personnel for domestic service, in which also the female workers are favorably situated, although there is an unexpectedly large number of disorders of the skin and the urinary and generative organs; the commercial trades, with a comparatively large amount of nervous diseases; and the hotel and restaurant trade. Also the textile workers show an exceptionally low frequency of sickness; the mortality also is low, but, in contrast with the men, women textile workers are, from the standpoint of health, unfavorably situated.

The middle position, with marked local fluctuations, is occupied by: the chemical industry and the administrative service, but with an exceedingly high incidence of nervous disease in both sexes, and of heart disease in males; the workmen engaged in the handling of food products, including food luxuries; the clothing and cleaning industry, but with a high percentage of tuberculosis; paper making and allied trades, and (though with a small representation) agriculture. The marked local fluctuations in these groups are due to the fact that they comprise in different regions quite different callings; for instance, in one region, under dealers in food and luxury products are included bakers, butchers, brewers and tobacco workers.

Unfavorably situated are: workers in metals, with a high incidence of injuries, a high mortality in the low age groups but with a rather favorable mortality in the upper age groups; with reference to frequency of sickness still more unfavorable, but, with respect to mortality, the women workers in the metal industries have a better record than the men.

Workmen in the wood turning and carving trade are more unfavorably situated than the workers in metals, and in some localities the morbidity from tuberculosis is high. The building trades occupy an unfavorable position. No doubt, certain external factors, such as the seasonal nature of the occupation, contribute much to the uncommonly high frequency of sickness, but the high mortality points to the fact that the health conditions are actually unfavorable.

Marriages

WILLIAM WARD RUCKS, JR., Oklahoma City, Okla., to Miss Louise Douglas Earthman of Murfreesboro, Tenn., Dec. 10, 1929.

HAROLD J. GREER, East Stanwood, Wash., to Miss Esther Leola Urstad of Seattle, Dec. 26, 1929.

HAROLD EDWARD KELLOGG, Brookings, S. D., to Miss Julia Cook, February 11.

Deaths

Ralph **Palmer Beebe,** Kalamazoo, Mich.; University of Michigan Medical School, Ann Arbor, 1880; member of the Michigan State Medical Society, and the Associated Anesthetists of the United States and Canada; aged 75; died, February 18 at the Bronson Hospital of cerebral hemorrhage.

Maximilian Lewson ⊕ New York; Medical Department of the University of the City of New York, 1897; member of the American College of Surgeons; on the staff of the New York Polyclinic Medical School and Hospital; aged 54; died, February 11, at Matawan, N. J., of heart disease.

Malone Duggan, Danville, Ill.; University of Texas School of Medicine, Galveston, 1894; veteran of the Spanish-American and World wars; on the staff of the National Home for Disabled Volunteer Soldiers, where he died, January 31, of valvular heart disease and aortic stenosis, aged 61.

Orlando J. Hallenbeck, Canandaigua, N. Y.; Albany Medical College, 1879; member of the Medical Society of the State of New York; on the staff of the Frederick Ferris Thompson Memorial Hospital; aged 76; died, January 13, at the Brook's Memorial Hospital, Dunkirk.

George **Osman Keck,** Lapwai, Idaho; Jefferson Medical College of Philadelphia, 1900; past president of the Nez Perce County Medical Society; medical director of the Fort Lapwai Tuberculosis Sanatorium; aged 54; died suddenly, January 11, of heart disease.

Murry Hamilton Walker, Owensboro, Ky.; University of Louisville School of Medicine, 1912; member of the Kentucky State Medical Association; served during the World War; aged 46; died, February 16, in a hospital at Nashville, Tenn., of pneumonia.

Frederick Brook Smith ⊕ Watertown, N. Y.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1886; on the staff of St. Lawrence State Hospital, Ogdensburg, and the House of the Good Samaritan; aged 63; died, February 2, of pneumonia.

Charles Edwin Atwood ⊕ New York; Bellevue Hospital Medical College, 1883; member of the American Psychiatric Association; formerly on the staff of the Bloomingdale Hospital, White Plains; aged 68; died, February 19, of heart disease.

Daniel Woodbury Wynkoop, Babylon, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1896; served during the World War; formerly health officer; aged 57; died, January 25, at Onancock, Va., of heart disease.

Jacob William Kline, Easton, Pa.; Medico-Chirurgical College of Philadelphia, 1892; for twenty years member of the school board at Martin's Creek; aged 60; died, February 8, at the Betts' Private Hospital, of nephritis and heart disease.

Frank W. Olds ⊕ Williamstown, Mass.; Medical Department of Columbia College, New York, 1880; for twenty-five years chairman of athletic council of Williams College; aged 76; died, February 10, of arteriosclerosis and chronic nephritis.

Morris Gardner White, Brooklyn; Long Island College Hospital, Brooklyn, 1895; for many years on the staff of the Brooklyn Eye and Ear Hospital; aged 66; died suddenly, February 3, of cerebral hemorrhage and arteriosclerosis.

William Edwin Luter ⊕ San Antonio, Texas; University of Texas School of Medicine, Galveston, 1896; member of the American College of Surgeons; aged 61; died, February 16, at the Santa Rosa Infirmary, of cerebral hemorrhage.

Witter Kinney Tingley ⊕ Norwich, Conn.; Bellevue Hospital Medical College, New York, 1886; formerly city health officer and councilman; surgeon in chief at the William W. Backus Hospital; aged 67; died, February 22.

Presley S. Downs ⊕ Dover, Del.; University of Pennsylvania School of Medicine, Philadelphia, 1878; formerly secretary of the Medical Society of Delaware Examining Board; aged 75; died in February of heart disease.

Marcus Whitney Knight ⊕ Milford, Mass.; University of Vermont College of Medicine, Burlington, 1882; aged 68; died, February 1, at the New England Baptist Hospital, Boston, following an operation for mastoiditis.

John Harvey Bush ⊕ Boulder, Colo.; Medical Department of the University of Illinois, Chicago, 1899; formerly health officer of Boulder; aged 59; died, February 4, at the home of his daughter in Des Moines, Iowa.

Walter Thomas Brown, Linnton, Ore.; Medical Department, University of Tennessee, Nashville, 1893; aged 62; died, January 31, in a hospital at Vancouver, Wash., of injuries received in an automobile accident.

John E. Tuite ⊕ Rockford, Ill.; Rush Medical College, Chicago, 1900; past president of the Illinois State Medical Society; on the staff of the Rockford Hospital; aged 65; died, February 26, of pyonephrosis.

Henry Franklin Hoyt, Long Beach, Calif.; Starling Medical College, Columbus, 1882; veteran of the Spanish-American War; aged 75; died, January 21, in Yokohama, Japan, while en route to America.

William Dudley Hall ⊕ South Dennis, Mass.; Harvard University Medical School, Boston, 1883; member of the American Ophthalmological Society; aged 73; died, February 12, of heart disease.

Edward Waldo Emerson, Concord, Mass.; Harvard University Medical School, Boston, 1874; member of the Massachusetts Medical Society; aged 85; died, January 27, of bronchopneumonia.

Adam P. Fogleman, Sheridan, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1884; member of the Medical Society of the State of Pennsylvania; aged 70; died, January 11.

Hiram Benson Manchester, Batavia, N. Y.; University of Vermont College of Medicine, Burlington, 1880; on the staff of St. Jerome's Hospital; aged 73; died in February of cerebral hemorrhage.

Jesse Williams Hedden ⊕ New York; Medical Department of the University of the City of New York, 1887; aged 65; died, February 14, of coronary thrombosis and chronic myocarditis.

Joseph Russell Tarpley ⊕ Nashville, Tenn.; Medical Department University of Tennessee, Nashville, 1907; aged 47; died, February 18, at the Protestant Hospital, of cerebral hemorrhage.

William A. Graham, Charlotte, N. C.; Medical Department of Columbia College, New York, 1888; member of the Medical Society of the State of North Carolina; aged 64; died, January 21.

John Francis Xavier Cannon ⊕ Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1920; aged 31; died, February 13, at St. Agnes Hospital, of pneumonia.

Loyal Graham Lutz ⊕ Roscoe, Pa.; University of Pittsburgh School of Medicine, 1904; aged 50; died, January 19, at the Monongahela (Pa.) Memorial Hospital, of heart disease.

Joshua Meek Hamilton, Shawanee, Tenn.; Tennessee Medical College, Knoxville, 1900; member of the Tennessee State Medical Association; aged 56; died, February 12.

William L. Quinn, Fayette City, Pa.; College of Physicians and Surgeons, Baltimore, 1896; aged 58; died, February 7, at the Mercy Hospital, Pittsburgh, of heart disease.

Louis Gabriel Kaempfer, New York; Columbia University College of Physicians and Surgeons, New York, 1905; aged 48; died, February 17, of aortic insufficiency.

Lewis Craig Miller ⊕ Twelve Mile, Ind.; University of Michigan Medical School, Ann Arbor, 1895; aged 60; died, February 8, of heart disease and arteriosclerosis.

Menzo B. Mattice, Sedro Woolley, Wash.; Albany (N. Y.) Medical College, 1881; member of the Washington State Medical Association; aged 74; died, Dec. 25, 1929.

Walter A. Scroggin, Visalia, Ky.; Louisville Medical College, 1893; member of the Kentucky State Medical Association; aged 71; died, February 10, of angina pectoris.

William F. Weidner, Monroe, Iowa; Chicago Homeopathic Medical College, 1885; aged 83; died, February 2, as the result of a fractured hip received in a fall.

Roy Wallace Whaley, Browning, Mo.; Washington University School of Medicine, St. Louis, 1904; aged 48; died, Dec. 17, 1929, of progressive spinal sclerosis.

Edward Oscar Moore, Midlothian, Texas (registered, Texas, by the state board of medical examiners, under the Act of 1907); aged 69; died, February 4, of myocarditis.

John Michael Keyes, New York; Long Island College Hospital, Brooklyn, 1895; served during the World War; aged 56; died, February 9, of heart disease.

Henry Lewis Burwell, Roanoke, Va.; Kentucky School of Medicine, Louisville, 1879; member of the Medical Society of Virginia; aged 73; died, January 29.

Seldon Bennett Sperry, Milwaukee; Medical College of Indiana, Indianapolis, 1881; aged 70; died, January 31, at the Columbia Hospital, of pulmonary fibrosis.

Lewis Fish Bennett ✠ Beloit, Wis.; Rush Medical College, Chicago, 1886; member of the Washington State Medical Association; aged 69; died, January 19.

Charles F. Wicker, Saranac Lake, N. Y.; Albany Medical College, 1880; aged 72; died, February 6, at Plattsburg, of arteriosclerosis and cerebral hemorrhage.

Edwin P. Wallace, Cusick, Wash. (registered, Wisconsin, by the State Board of Medical Examiners in 1899); also a druggist; aged 81; died, January 6.

George W. Huber, Gaston, Ind.; Eclectic Medical College of Indiana, Indianapolis, 1907; aged 61; died, February 2, at the Ball Memorial Hospital, Muncie.

Andrew Snody Oman, Middletown, Conn.; L.R.C.P., L.R.C.S., Edinburgh, and L.R.F.P.S., Glasgow, 1899; aged 61; died in January.

William Henry Taylor, New Market, Tenn.; Vanderbilt University School of Medicine, Nashville, 1883; aged 76; died, January 25, of carbuncle.

Curtis T. Wolford ✠ Grand Rapids, Mich.; American Medical College, Indianapolis, 1896; aged 66; died, February 18, at Rochester, Minn.

Thomas Henry Grady ✠ Clinton, Mass.; Baltimore Medical College, 1901; on the staff of the Clinton Hospital; aged 53; died, January 20.

Frederick William Moses, Indianapolis; Eclectic Medical Institute, Cincinnati, 1893; aged 75; died, February 18, of heart disease and nephritis.

Alexander Ross Mackenzie, Capitol Heights, Md.; Hahnemann Medical College and Hospital of Philadelphia, 1895; aged 65; died, January 24.

William B. Christine, Scranton, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1877; aged 75; died, January 24.

George C. Brown, Dunmore, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1880; aged 71; died, January 26.

Vincent Shepherd ✠ Dupont, Ind.; Medical College of Indiana, Indianapolis, 1897; aged 58; died, February 9, of carcinoma.

Wesley Wilson ✠ Newburgh, Ind.; Indiana Medical College, Indianapolis, 1873; Civil War veteran; aged 84; died, January 25.

Louis M. Benepe ✠ St. Paul; Missouri Medical College, St. Louis, 1888; aged 67; died, February 14, of chronic myocarditis.

Mary A. Eckstein, Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1890; aged 80; died, February 16.

Oscar Brent Baldwin, Sanford, N. C.; Leonard Medical College, Raleigh, 1913; aged 52; was found dead in bed, February 8.

Nicholas F. Kiefer, Pleasantville, N. Y.; University of Buffalo School of Medicine, 1881; aged 73; died in December, 1929.

Edward L. Seay ✠ Denison, Texas; University of Louisville (Ky.) School of Medicine, 1896; aged 56; died, January 31.

Lester Olin Thompson, Red Oak, Iowa; Homeopathic Hospital College, Cleveland, 1882; aged 72; died, January 23.

Robert Haley ✠ Brookfield, Mo.; St. Louis Medical College, 1884; aged 70; died, February 2, of chronic nephritis.

Daniel R. Coryell, Myrtle Creek, Ore.; Medical College of Ohio, Cincinnati, 1883; aged 72; died, January 2.

Daniel Cady Darrow, Moorhead, Minn.; Rush Medical College, Chicago, 1884; aged 80; died, January 10.

William J. Adair, Rockmart, Ga.; Atlanta Medical College, 1879; aged 73; died, February 4, of hemiplegia.

Bureau of Investigation

TOBACCO ADVERTISING GONE MAD

The Health Angle, as Exploited by "Lucky Strike Cigarets" and "Cremo Cigars"

The modern tendency for advertisers of all kinds of merchandise to drag the health angle into their advertisements is one of the most disturbing features in the modern advertising field. The medal for the most horrible example would seem to go to the American Tobacco Company. In the spring of 1927 the advertising agency for this concern circularized a large number of American physicians in the interests of "Lucky Strike Cigarets." Each physician received a carton of a hundred cigarets and a questionnaire, consisting of a card carrying two questions. The first of these questions read:

"1. In your judgment is the heat treatment, or toasting process, applied to tobacco previously aged and cured, likely to free the cigaret from irritation to the throat?"

Obviously, not one physician in ten thousand is, or could be, competent to answer this question. Yet the exploiters of Lucky Strike Cigarets have claimed that over 18,000 physicians answered that question in the affirmative! If this claim is not grossly false, it does not redound to the credit of the eighteen thousand. But that is not all. There was then started the campaign, "Reach for a Lucky instead of a Sweet," in which —either directly or by implication—young women were urged to smoke Lucky Strike Cigarets when they had a desire to eat candy, or pastry. Trade protests brought a discontinuation of the "Reach for a Lucky instead of a Sweet" slogan, but the present advertising practically carries with it the same suggestion. In it are shown pictures of a young girl in profile, casting a shadow in which a double chin is the main feature, and suggesting the use of Lucky Strikes as an aid to moderation in eating!

Another branch of the American Tobacco Company's business—the American Cigar Company—has been carrying on an advertising campaign of its product, the "Cremo Cigar," in which the public is led to believe that most cigars are handmade and have their tips finished off with the saliva of the individual workman. This campaign features a testimonial from Alfred McCann, who "emphatically states" that Cremo Cigars are not "spit-tipped." This is the same McCann who —graduating from an advertising man to a "food expert"—a few years ago was boosting the old discredited nostrums, "Russell's Prepared Green Bone" and "Russell's Emulsion," that were for some time exploited on the basis of the so-called lime starvation theory as the cause of tuberculosis.

There is evidence that the Cremo Cigar people are about to attempt to do to the medical profession what the Lucky Strike concern did a year or two ago. A physician receives a circular-letter which details the horrific menace of the spit-tipped cigar. He also receives "five certified Cremo Cigars."

The facts just given are of importance to the medical profession in its function as guardian of the public health. Physicians will readily admit that many young women eat more candy than is good for them, but they will certainly not agree that the substitution of cigarets in such cases is in the interest of public health. Physicians may also admit that, theoretically, it is possible for disease to be transmitted by means of cigars. But when one considers the millions of cigars that are consumed annually and that it is extremely difficult to find in medical literature any real evidence of the transmission of pathologic bacteria by means of cigars, the campaign of the Cremo concern stands condemned.

But physicians have a further interest in this problem—at least, many physicians do—not as physicians, but as men who enjoy a good cigar or cigaret. Advertising of this sort is pernicious from the social standpoint. If kept up persistently enough, it is likely to result in an attempt by the anti-tobacco fanatics to get on the statute books legislation prohibiting the sale and manufacture of tobacco products. The result would probably be another "holy war" that will make the scientific discussion of the tobacco problem as difficult as the scientific discussion of the alcohol problem is today.

MORE MISBRANDED NOSTRUMS

Abstracts of Notices of Judgment Issued by the Food, Drug and Insecticide Administration of the United States Department of Agriculture

Kroy Wen All Healing Ointment.—The Manhattan Drug Company of Brooklyn, N. Y., shipped in March, 1929, into Connecticut a quantity of Kroy Wen All Healing Ointment, which was declared misbranded. The ointment was found to consist essentially of carbolic acid, zinc oxide, boric acid, sulphur and a volatile oil in a mixture of wax and wool-fat. The curative claims made for it, to the effect that it was a "Healing Nutritive Emollient" for wounds, piles, ulcers, ringworm and all skin diseases, were declared false and fraudulent, and in May, 1929, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment 16573; Issued February, 1930.*]

Wag's Salve.—Wag's Chemical Company, Inc., of Knoxville, Tenn., shipped in February, 1929, into Virginia a quantity of Wag's Salve that was declared misbranded. The preparation, on analysis, was found to be a petrolatum product with oil of wintergreen and menthol. The curative claims, to the effect that it was a remedy for croup, pneumonia, tonsillitis, catarrh, rheumatism, headache, piles, boils, eczema and various other conditions, were declared false and fraudulent and in June, 1929, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment 16559; Issued February, 1930.*]

Winter Cerate.—The Irvine Chemical Company of Idaho Falls, Idaho, shipped in October, 1928, into Utah a quantity of R Winter Cerate, which was declared misbranded. The preparation was found to be an ointment having a petrolatum base and containing the usual volatile oils. The curative claims made for it, to the effect that it was a preventive in all forms of contagious diseases and would give relief in hay fever, cough, pneumonia, rheumatism, etc., were declared false and fraudulent, and in May, 1929, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment 16571; Issued February, 1930.*]

Amex.—The Craig-Grandell Manufacturing Company, Inc., of Whitefield, N. H., shipped in January, 1929, into Maine a quantity of Amex that was declared misbranded. The preparation was an ointment having a petrolatum base and containing oil of wintergreen, oil of peppermint, menthol and myrrh. The curative claims made for the preparation, to the effect that it was a remedy for coughs, bronchitis, aching feet, piles, erysipelas, rheumatism, etc., were declared false and fraudulent, and in April, 1929, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment 16569; Issued February, 1930.*]

Quin-Lax.—James Bailey and Son, Baltimore, Md., shipped in February, 1929, into Virginia a quantity of Quin-Lax that was declared misbranded. Each Quin-Lax tablet was found by federal chemists to contain acetanilide, cinchonine, aloin and cornstarch. The therapeutic claims, to the effect that it was a remedy for influenza, coughs, etc., were declared false and fraudulent, and in June, 1929, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment 16560; Issued February, 1930.*]

Neuro-Nerve Powders.—The Neuro Chemical Company of West New Brighton, N. Y., shipped in January, 1929, into Connecticut a quantity of Neuro-Nerve Powders that were declared misbranded. The powders were found to contain aspirin, phenacetine and caffeine. The curative claims made for them, to the effect that the product was a remedy for influenza, neuralgia, sciatica, toothache, etc., were declared false and fraudulent, and in March, 1929, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment 16574; Issued February, 1930.*]

Laxative Phospho Quinine.—Brewer and Company, Inc., of Worcester, Mass., shipped into Maine in January, 1929, a quantity of Laxative Phospho Quinine Capsules that were declared misbranded. The capsules were found to contain acetanilide, cinchona alkaloids, phenolphthalein, red pepper, gamboge and some other materials. The product was falsely and fraudulently labeled as a remedy for influenza, neuralgia, malaria, etc. In April, 1929, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment 16553; Issued February, 1930.*]

Glycero-Terpin Compound.—In January and April, 1929, Boss and Seiffert Company, Inc., Providence, R. I., shipped to Massachusetts a quantity of Glycero-Terpin Compound that was misbranded. Analysis showed the preparation to contain a codeine salt, chloroform, terpin hydrate, ammonium chloride, tolu, glycerine and alcohol. The curative claims, to the effect that it was a remedy for consumption, influenza, bronchitis, etc., were declared false and fraudulent and in June, 1929, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment 16557; Issued February, 1930.*]

Salicon.—The K. A. Hughes Company of Boston, Mass., shipped into Maine in February, 1929, a quantity of Salicon that was declared misbranded. Each Salicon tablet was found by the federal chemists to contain 3.8 grains of aspirin, with phenolphthalein and calcium and magnesium carbonates. It was charged that the claims that the product did not affect the

"Does your neuralgia trouble you?"
"No! I'm entirely free from pain since I took
These efficient tablets relieve pain harmlessly.
Salicon

heart or upset the stomach and could be used "freely and fearlessly," that it was a germicide, that it sterilized the blood and that it was a remedy for influenza, rheumatism, neuralgia, neuritis, lumbago, headache, backache, earache and various other conditions, were false and fraudulent. In May, 1929, the K. A. Hughes Company appeared as claimant and judgment of condemnation and forfeiture was entered, and the court ordered that the product be released to the company on payment of costs and the execution of a bond requiring the K. A. Hughes Company to empty the Salicon from the containers into unlabeled boxes, or remove entirely and destroy the bottle labels, circulars, brandings, cartons and all printed matter that accompanied the product.—[*Notice of Judgment 16566; Issued February, 1930.*]

[NOTE.—Salicon was the subject of an article that appeared in this department of THE JOURNAL, Feb. 5, 1921, at the time the A. M. A. Chemical Laboratory analyzed it.]

Capsi-Quin.—Boss and Seiffert Company, Inc., Providence, R. I., shipped in January and April, 1929, to Massachusetts a quantity of Capsi-Quin Compound Tablets that were declared misbranded. The tablets were found to contain about 1 grain of quinine sulphate, 1⅓ grains of acetanilide and a small amount of red pepper in each tablet. The product was declared misbranded, first, because the amount of acetanilide declared on the label was less than the amount present and, second, because the claims that it was a remedy for influenza, fever, etc., were false and fraudulent. In June, 1929, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment 16557; Issued February, 1930.*]

Correspondence

OHIO-DISTRICT OF COLUMBIA RECIPROCITY

To the Editor:—My attention has been called to a letter in THE JOURNAL, February 15, in which Dr. W. C. Fowler, secretary-treasurer for the Commission on Licensure for the District of Columbia, writes concerning the action of the Ohio board in severing reciprocal relations in medical licensure with the district.

For the first time the Ohio board learns that the District of Columbia Basic Science Board is not satisfied with the examinations given by Ohio in the subjects of anatomy, physiology, chemistry, bacteriology and pathology. No request has been made to this office to furnish the Basic Science Board with the questions given in Ohio. The District of Columbia could easily have obtained this information directly or could have learned from the American Medical Association offices that the Ohio examination occupies a period of three days—two days of written and one of practical, oral and bedside work, and further that no applicant is admitted to the Ohio examinations who does not possess a diploma of graduation from a medical school holding membership in the American Medical College Association.

This seems to be the crux of the whole situation: Ohio holds to the opinion that an individual holding an Ohio license based on satisfactory credentials must not be required to take examination in the basic sciences for the third time before he is accorded reciprocity with another state. Ohio does not believe that a first or second line of defense should be interposed against such applicants but holds to the belief that the basic science requirements should be exacted of all applicants who do not submit evidence of qualification which would have permitted them to graduate from a school holding membership in the American Medical College Association.

H. M. PLATTER, M.D., Columbus, Ohio.
Secretary, State Medical Board.

TESTS IN SPLENOMEGALY

To the Editor:—I should like to call the attention of the profession in America to two simple laboratory tests applicable to cases of splenomegaly. Brahmachari (*Indian M. Gaz.* **52**:319 [Sept.], 429 [Dec.] 1917; Kala-Azar and Its Treatment, ed. 2, 1920) reported in 1917 that a copious precipitate was frequently observed when the serum of kala-azar patients was mixed with an excess of distilled water. Napier (*Indian M. Gaz.* **56**:338, 1921; **58**:104 [March] 1923) in 1921 further reported that, when 2 drops of liquor formaldehydi is added to 1 cc. of clear serum of kala-azar patients, opacity and jellification occur within half an hour. These two tests have subsequently been found to be positive in cases of schistosomiasis (Meleney, H. E., and Wu, Hsien: *China M. J.* **38**:357 [May] 1924). The phenomena have been attributed to an increase in the serum globulin in these patients (Brahmachari, *loc. cit.* Sia, R. H. P., and Wu, Hsien: Serum Globulin in Kala-Azar, *China M. J.* **35**:527 [Nov.] 1921). While Sia (*China M. J.* **35**:397 [Sept.] 1921) reports the test negative in a large variety of cases, it has been my experience and that of others in this locality that both these tests may be positive, the formaldehyde test less frequently so, in cases of splenomegaly which we have reason to believe are neither kala-azar nor schistosomiasis. I suggest that the simple globulin test be done as a routine in all patients with spleen disease, thus affording an indication for the more complex formaldehyde test, and likewise for a quantitative globulin estimation (Wu, Hsien: A New Colorimetric Method for the Determination of Plasma Proteins, *J. Biol. Chem.* **51**:33 [March] 1922). It may be that the application of these simple tests may lead to further more detailed classification of the splenomegalies.

For the globulin precipitation test, Sia (A Simple Method for Estimating Quantitative Differences in the Globulin Precipitation Test in Kala-Azar, *China M. J.* **38**:35 [Jan.] 1924) has described a simplified and standardized technic which may be easily carried out simultaneously with routine white counts. Fox and Mackie (The Formol-Gel Test in Kala-Azar, *Indian M. Gaz.* **56**:374 [Oct.] 1921) have described a simplified method of carrying out the formaldehyde test. It is to invert a slide bearing a drop of serum over a watch glass containing a few drops of solution of formaldehyde. The serum will solidify and become opaque in a few minutes in a positive case.

HORACE E. CAMPBELL, M.D.,
Foochow, Fukien, China.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

STERILIZATION AND PREVENTION OF CONCEPTION

To the Editor:—I have a patient, a woman, aged 30, married, whose husband is 32 years old. They have been married ten years and have four children, none of whom are healthy. The patient has had a tuberculous infection of one lung for about six years. A flare-up occurred after each of the last three childbirths. The last kept her in bed with the usual symptoms of tuberculosis for about eight months. Each reinfection seems to be worse, and as soon as she begins to improve she becomes pregnant. Neither she nor her husband will submit to any surgical treatment whereby one can be made sterile, although both desire something to be done. It seems certain that unless something is done to prevent another pregnancy she will not live to mother the four children she now has. Will the gold stem pessary prevent her from conceiving again? Is there any other device that I can introduce into the cervix that will prevent conception? The chances for irritation and secondary results are not any worse than what she will have if she has to go through with another pregnancy, so what I am after is finding something that is fool-proof. What treatment is best in such a case other than the known routine against tuberculosis? In such cases birth control should be taught; however, these people are not of high enough type to trust with contraceptive devices or preparations because they have tried them and failed. The charity organization now has the family on its hands most of the time and it is a social problem to prevent any more children being born into this home, which already has more than the provider can support. Use only initials and state address.

M.D., Tennessee.

ANSWER.—This case presents a real problem because the patient and her husband refuse to be sterilized by operation and because they are either too poor or too irresponsible to make use of one of several different contraceptives. The gold "safety" pessary, about which inquiry is made, is by no means "safe." It is not always successful in preventing conception and it has even been found embedded in a full term placenta. Such a pessary frequently produces a severe cervical and uterine infection which may have unpleasant consequences (Queries and Minor Notes, THE JOURNAL, Dec. 21, 1929, p. 1993). Nearly all intracervical pessaries have the same disadvantages. As far as is known there is no "fool-proof" way of preventing conception. If the patient is not intelligent enough to use such common contraceptive measures as condoms, suppositories, jellies, tampons and cap pessaries, measures which are only fairly dependable, then either operation or irradiation must be employed. Since the patient objects to a surgical operation she may perhaps submit to the application of radium or x-rays to produce temporary castration. The temporary removal of ovarian function may permit this patient to gain weight and improve her general health, and of course avoid the harm done by repeated pregnancies. The only drawback is that the patient may not know the ovaries are active again until she is pregnant; for pregnancy may occur during an amenorrhea produced by x-rays or radium. Permanent castration by irradiation may be the only solution in this case, but at the age of 30 this procedure is a serious one and should be done only after considerable deliberation.

PROPHYLAXIS AGAINST POISONING BY BENZENE, TOLUENE, XYLENE AND NAPHTHA

To the Editor:—I have recently diagnosed benzene poisoning in several workers in a large paint factory, mostly among those in the laboratories. Diagnosis has depended mainly on the leukopenia. I have been asked to try to eliminate this hazard and to date have managed to have the ventilating system changed but still get minor symptoms in a few of the men. Toluene, xylene and naphtha are the worst offenders. Could you suggest any prophylaxis other than Bloomfield's substitution or regular examination of the blood? I have in mind such things as masks, medication or diet.

SIDNEY W. RAYMOND, M.D., Chicago.

ANSWER.—Leukopenia as predicated on single isolated blood counts may not, in fact, be a true leukopenia. Such variation occurs daily in the normal blood count for both red and white cells that single isolated counts may yield results falling within the anemic or leukopenic zones (McCord, C. P.: The Present Status of Benzene (Benzol) Poisoning, THE JOURNAL, July 27, 1929, p. 280). The earliest known laboratory evidence of the toxic action of benzene is the increase in basophilic-containing red cells, due to irritation of the erythrogenic centers in bone marrow (Paul, W. D.; Friedlander, Alfred; and McCord, C. P.: Basophilic Material in Benzol Poisoning, *J. Indust. Hyg.* **9**:193 [May] 1927).

Toluene and xylene are more toxic than benzene as a source of acute poisoning. If the naphtha mentioned is "solvent naphtha," a high content of benzene is entailed.

The following regimen constitutes the best known program of protection at this time:

1. Substitutes for benzene should be used whenever possible in the industrial formulation involved. Several paint industries have practically eliminated benzene as a paint constituent.

2. An interferometer should be used for the quantitative determination of benzene in the air, provided, however, that other possible air contaminants are not such as to give false readings for benzene.

3. If the quantity of benzene reaches 100 parts per million, ventilation measures should be increased, providing for downward air removal, of such velocity as will keep the quantity of benzene below the 100 parts per million concentration.

4. All exposed persons should be regularly examined by blood counts, with stress on high basophilic red cell counts and low white counts. In the event of both or either being found, several blood examinations should be made in a single twenty-four hour period to determine the constancy of counts within respectively high and low ranges.

The use of masks for continuous wear is onerous and difficult of attainment. No medication is of established value for prophylactic purposes.

USE OF HILUM OR HILUS

To the Editor:—Please give the profession a lexicographic report on hilum-hilus. In the singular it is found in literature hilum and hilus, in the plural hili, hila and hilus, with no attempt at oblique cases. Lexicographers sidestep the issue. We do not know whether it is of the first or second declension, whether it is hilum or hilus in the singular, hilii, hila or hilus in the plural. Please give the preferable name throughout all cases. We should either settle definitely on this word or discard it entirely and use the English word "root."

E. C. THRASH, M.D., Atlanta, Ga.

ANSWER.—As these words are of the second declension, the respective plurals are hila and hili; when the words appear in English sentences there is no need for considering the forms of the oblique cases.

Some medical writers use hilum; others prefer hilus. That a choice between the two is not altogether a simple matter becomes evident when one consults a dictionary.

The Standard, Century and Webster's dictionaries give hilum as preferred, with hilus as a variant. The American Illustrated Medical Dictionary and Gould's Medical Dictionary prefer hilum. Foster's Medical Dictionary calls hilus an improper form of hilum. Stedman's Medical Dictionary gives hilum but says that it is now usually called hilus [B N A], a variant of hilum.

The form adopted by the Basle Anatomical Nomenclature is hilus.

The Oxford Dictionary gives hilus, not hilum, as the term used in the anatomic sense.

Guttmann's Medizinische Terminologie gives hilus and raises the question of the derivation.

Hilum is the form given in Harper's Latin Lexicon. Hilum is the primitive of nihilum, i. e., ne-hilum and nihil, of unknown etymology, meaning a little thing, a trifle.

Hilus perhaps is from the Greek ἦλος (helos), meaning originally a nail head or stud but eventually anything like a nail—a wart, knot or callus. Then, again, hilus is considered as a modern Latin form altered from hilum, which, according to the lexicographer Festus, originally meant "that which adheres to a bean." The Oxford definition of hilus is the point at which any one of the viscera has its junction with the vascular system; a notch or fissure where a vessel enters an organ.

The Basle Anatomical Nomenclature is followed by the American Medical Association Press.

MENTAL DETERIORATION AFTER EPIDEMIC ENCEPHALITIS

To the Editor:—I have on hand a case of defective mentality that is puzzling me greatly, in a boy, aged 10 years, who has the intellect of a child of 4. This mentally defective condition is due to epidemic encephalitis at the age of 3. The boy is perfect physically and is active. He has lived in the open air, under the care of a special nurse, for the past few years. He perceives everything in his environment and understands what is said to him and can carry a tune with the words and answer certain questions briefly, but he has no initiative to act or to speak. Could you help in this case by suggesting some private school that you know of, within the limits of the United States, that has facilities in the way of leadership and personal instruction for a limited number of such children? I believe that if such a school could be found it would be beneficial to this boy. The companionship of other boys is seemingly what is needed to develop this boy's powers of intellect, as he has been kept secluded in the country, away from other children. Would endocrine therapy be of any value? Please omit name.

M.D., New York.

ANSWER.—There are a number of such schools in the United States and a list of them can be secured by writing to the National Committee for Mental Hygiene, 370 Seventh Avenue, New York. Endocrine gland therapy has, as a rule, little effect in cases of chronic epidemic encephalitis. If there are evidences of glandular disorder, study of these would give indications for appropriate therapy.

SENSITIVITY OF SKIN TO PHOTOGRAPHIC CHEMICALS

To the Editor:—An amateur photographer consulted me because of a dermatitis on both hands. In the course of his work his hands come in contact with sodium hyposulphite and dilute acetic acid. In the developer his hands are exposed to potassium bromide, amidol, sodium sulphite and potassium alum. In your opinion, which is the usual offending chemical? Please omit name.

M.D., Indianapolis.

ANSWER.—Of the substances mentioned, the likely offender is "amidol," which is diamidophenol, $C_6H_3OH(NH_2)_2$. Amidol is believed to be far less irritating to the skins of photographers than "metol," which is the trade name for monomethyl-*p*-amido-*m*-cresol sulphate. The afflicted photographer should be consulted as to the present or past use of metol. After one attack of metol dermatitis there appears to be a heightened susceptibility which may extend to other substances, such as amidol. Even though metol may have not been previously included in the chemicals to which there is exposure, amidol itself is capable of producing a dermatitis.

Not all persons are equally susceptible to the action of these photographic chemicals. Many persons may handle metol with impunity, while others are caused the greatest discomfort by minute quantities. A number of persons susceptible to metol dermatitis have shifted to the use of amidol and have escaped inconvenience.

HERPES LABIALIS AT MENSTRUATION — DISCOLORATION OF SKIN FROM WEARING GOLD ORNAMENTS

To the Editor:—Two questions I am interested in: 1. A patient, when the menses are beginning every month, has an outbreak of labial herpes. It has been going on for a year and a half, with no definite thing in the history that one can associate with its beginning or occurrence. Can you give me any information as to its cause or its treatment? 2. A discoloration (a dark stain) occurs in certain individuals, particularly in women wearing gold ornaments about the neck, and in many who wear glasses. When this occurs in those wearing gold rims, what is the explanation? Can the condition be avoided by treatment, the patient still continuing the wearing of the gold rims or the gold neck pieces? Please do not use name.

M.D., Massachusetts.

ANSWER.—1. Herpes labialis is one of a number of dermatologic manifestations, such as urticaria, eczema, pruritus and furunculosis, which occur regularly just before or during each menstrual period. Herpes labialis usually occurs during the premenstrual period and generally recurs for many years not only at the same time in the menstrual cycle but also in the same location. Hence there is not only a predisposition of the individual to herpes but also a predisposition of a certain part of the skin or mucous membrane. Premenstrual or menstrual herpes is chiefly found on the external genitalia and face, especially the lips, but occasionally it is seen on the neck, the genital regions, the breasts, the thighs, the hands, the mucous membrane

of the mouth and throat, and other places. The treatment of these conditions is generally symptomatic. However, one author (R. Schroeder) caused the disappearance of menstrual herpes labialis in one patient by giving her small doses of epinephrine seven or eight times at two-day intervals. Many observers believe that some genital diseases, such as inflammation of the adnexa, hypoplasia or myomas of the uterus, are responsible for the skin conditions appearing during the menses and that the skin manifestation disappears spontaneously after the disease of the genitalia has been eliminated.

2. The stains after wearing gold are due to the formation of sulphides of the metals used as alloys for the gold, commonly silver or copper. Eye glasses can be fixed by lining the nose piece with cork or some fabric. It might be possible to prevent actual contact of gold necklaces with the skin by covering the latter with a thick layer of skin colored zinc oxide paste; but of course this would not work if the wearer perspired freely.

TREATMENT OF TREMOR WITH ACETYLSALICYLIC ACID — SILK UNDERWEAR AND DERMATITIS

To the Editor:—1. Is there any foundation for the reports of a Dr. L. Rosenbund to the effect that cases of "gross senile tremor" may be satisfactorily treated with massive "doses of salicylic acid in the form of aspirin"? He claims "no relapses seen during the period of one to three and one half months while the patients were kept under observation." 2. Please inform me as to the disadvantages, if any, in the use of modern silk underwear. The old fashioned underwear could be boiled; therefore, it was more favorable to see it when a patient appeared with a case of scabies. Are there other good reasons for advocating underwear which can be boiled in place of the silk which cannot?

SARAH PARKER WHITE, M.D., Syracuse, N. Y.

ANSWER.—1. Senile tremor, as usually understood, is due to a degenerative change in nerve cells. There is therefore no ground for any assertion that any drug will remove the tremor.

2. There is no serious disadvantage, as far as the skin is concerned, in the use of modern silk underwear. At rare intervals the skin is sensitized to silk and such a person gets a dermatitis from contact with it. Modern silk underwear can be washed in soap and tepid water. That provides for cleanliness. If it needs to be sterilized, it could be immersed in a 1:1,000 corrosive mercuric chloride solution, probably without damage. While there are certain advantages in advocating underwear that can be boiled, the need for sterilization of the underwear is not sufficiently pressing, it would seem, in the ordinary clean individual, to insist on this quality in underwear.

PSYCHOLOGIC CAUSE OF FRIGIDITY

To the Editor:—One of my patients, a married woman, aged 21, a few months after marriage used a prepared ointment in the vagina as a contraceptive. She used this only once and had considerable burning. Since that time, a period of three years, intercourse has not afforded her pleasure. Do you think that the use of the ointment could have been the cause, and, if so, is there any remedy?

M.D., Oklahoma.

ANSWER.—It is probable that the permanent effects from the ointment were psychic rather than physical. Escharotic destruction of the epithelium of the external cervix, highly sensitized in some persons, might decrease sexual happiness but would not destroy it. If there has been persistent discharge, with associated vulvovaginal irritation and dyspareunia since employment of the paste, complete frigidity might result; otherwise the patient's reaction must be essentially functional.

TREATMENT OF TRICHOMONAS INTESTINALIS

To the Editor:—I shall appreciate it if you will outline for me the best treatment for infestation with *Trichomonas intestinalis.*

M. S. STOVER, M.D., Matagalpa, Nicaragua.

ANSWER.—Unfortunately, there is no well established remedy in trichomoniasis; and various treatments are recommended as "best" by different authorities. Thus, Castellani recommends methylthioninе chloride in 0.12 to 0.18 Gm. capsules thrice daily by mouth and bowel irrigations with from 1:3,000 to 1:5,000 solution. Escomel considers turpentine almost specific. He gives oil of turpentine emulsion orally and rectally, but admits that there are cases resistant to turpentine, in which he recommends compound solution of iodine 1 part in 1,000 parts water as an enema on the evening of three successive days.

Of late, chiniofon-N. N. R. has been recommended in this condition as well as in the treatment of amebic dysentery. It is given orally in a dosage of from 0.25 to 1 Gm. in the form of pills or cachets three times daily, and rectally, from 1 to 5 Gm. freshly dissolved in 200 cc. of water at a temperature not exceeding 44 C. The course of the treatment may require weeks. The iodine content of chiniofon should be considered in patients with thyroid disturbance.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ARIZONA: Phoenix, April 1-2, 1930. Sec., Dr. H. P. Mills, 14 N. Central Ave., Phoenix, Ariz.

COLORADO: Denver, April 2-4, 1930. Sec., Dr. William W. Williams, 224 Capitol Bldg., Denver.

ILLINOIS: Chicago, April 8-10, 1930. Supt., Mr. P. B. Johnson, Springfield, Ill.

MINNESOTA: Minneapolis, April 1-2, 1930. Basic Science. Sec., Dr. E. T. Bell, 110 Anatomy Bldg., University of Minnesota, Minneapolis.

MINNESOTA: Minneapolis, April 15-17, 1930. Sec., Dr. E. T. Sanderson, 524 Lowry Medical Arts Bldg., St. Paul, Minn.

MONTANA: Helena, April 1, 1930. Sec., Dr. S. A. Cooney, Power Bldg., Helena, Mont.

NEW MEXICO: Santa Fe, April 14-15, 1930. Sec., Dr. W. T. Joyner, Roswell, N. M.

RHODE ISLAND: Providence, April 3-4, 1930. Dir., L. A. Round, Ph.D., 319 State Office Bldg., Providence, R. I.

WEST VIRGINIA: Charleston, April 8, 1930. Sec., Dr. W. T. Henshaw, Charleston, W. Va.

WISCONSIN: Madison, March 22, 1930. BASIC SCIENCE. Sec., Prof. R. N. Bauer, 3410 Wisconsin Ave., Milwaukee, Wis.

WISCONSIN: Milwaukee, April 8, 1930. Sec., Dr. Robert E. Flynn, 315 State Bank Bldg., La Crosse, Wis.

New York June Examination

Mr. H. J. Hamilton, chief of professional examinations of the state of New York, reports the written examination held at Albany, Buffalo, New York and Syracuse, June 24-27, 1929. The examination covered 9 subjects and included 10 questions. An average of 75 per cent was required to pass. Six hundred and sixty-nine candidates were examined, 578 of whom passed and 91 failed. One hundred and sixteen physicians were licensed by the endorsement of credentials. The following colleges were represented:

College	PASSED	Year Grad.	Number Licensed
University of Arkansas School of Med.	(1928, 2), (1929, 1)		3
University of California Medical School	(1928)		1
Yale University School of Medicine	(1928, 2), (1929, 3)		5
Georgetown Univ. School of Med.	(1927), (1928, 3), (1929, 2)		6
George Washington Univ. Med. School	(1928, 3), (1929, 6)		9
Howard University School of Med.	(1923), (1925), (1927)		3
Loyola University School of Medicine	(1929, 4)		4
Rush Medical College	(1928), (1929)		2
University of Kansas School of Medicine	(1929, 2)		2
University of Louisville School of Medicine	(1926)		1
Tulane Univ. of Louisiana School of Med.	(1928), (1929, 6)		7
Johns Hopkins University School of Med.	(1927), (1929, 2)		3
University of Maryland School of Medicine.	(1928), (1929, 18)		19
Boston University School of Medicine	(1926, 2), (1929, 4)		6
Harvard University Medical School	(1924), (1929, 3)		4
Tufts College Medical School	(1927), (1928, 4), (1929, 9)		14
University of Michigan Med. School	(1924), (1928), (1929)		3
St. Louis University School of Medicine	(1928), (1929)		2
Creighton University School of Medicine	(1928), (1929)		2
Albany Medical College	(1929)		17
Columbia University College of Physicians and Surgeons	(1925), (1926), (1927), (1928, 5), (1929, 55)		63
Cornell University Med. Coll.	(1927, 2), (1928, 3), (1929, 29)		34
Eclectic Medical College of New York City	(1910)		1
Long Island College Hospital	(1928, 7), (1929, 88)		95
New York Homeo. Med. Coll. and Flower Hosp.	(1929, 38)		38
Syracuse University College of Medicine	(1928, 30)		30
University and Bellevue Hospital Medical College	(1929, 90)		90
University of Buffalo School of Medicine	(1929, 56)		56
Eclectic Medical College of Cincinnati	(1929)		1
Hahnemann Medical College of Philadelphia	(1926), (1928)		2
Jefferson Medical College	(1910), (1925), (1928)		3
Univ. of Pennsylvania Sch. of Med.	(1918), (1927, 2), (1929, 3)		6
Woman's Medical College of Pennsylvania	(1929, 2)		2
Meharry Medical College	(1923), (1925, 2)		3
University of Tennessee College of Medicine	(1929)		1
Vanderbilt University School of Medicine	(1927)		1
Baylor University College of Medicine	(1929)		1
University of Texas School of Medicine	(1927)		1
University of Vermont College of Med.	(1928, 3), (1929, 2)		5
Dalhousie University Faculty of Medicine	(1923)		1
Queen's Univ. Faculty of Med.	(1926), (1927), (1928, 2)		4
University of Toronto Faculty of Medicine	(1926), (1927)		2
Univ. of Western Ontario Faculty of Med.	(1927), (1929, 2)		3
University of Vienna Faculty of Med.	(1921),* (1924)		2
University of Göttingen Faculty of Medicine	(1919)*		1
University of Munich Faculty of Medicine	(1923)		1
Royal Hungarian Univ. of Budapest Faculty of Med.	(1927)*		1
National Univ. of Ireland Faculty of Med.	(1922), (1926)		2
Royal University of Messina Faculty of Medicine	(1922)*		1
University of Rome Faculty of Medicine	(1926)*		1
University of Geneva Faculty of Medicine	(1928)*		1
Osteopaths			12

College	FAILED	Year Grad.	Number Failed
Yale University School of Medicine	(1928)	(1929)	2
Georgetown University School of Medicine	(1928, 3)	(1929, 2)	5
Howard University School of Medicine	(1928)		1
Rush Medical College	(1896)		1
University of Illinois School of Medicine	(1928)		1
University of Louisville School of Medicine	(1926)		1
University of Maryland School of Medicine	(1929)		1

Boston University School of Medicine.....(1927), (1928)	2
University of Michigan Medical College.....(1925)	1
St. Louis University School of Med...(1927), (1928), (1929)	3
Albany Medical College.....(1929, 2)	2
Columbia Univ. College of Med...(1927), (1928, 3), (1929, 4)	8
Cornell University Medical College.....(1929, 2)	2
Long Island College Hospital.....(1929)	1
New York Homeopathic Medical College and Flower Hospital.....(1916), (1929, 10)	11
University of Rochester School of Medicine.....(1929)	1
Syracuse University College of Medicine.....(1929, 3)	3
University of Buffalo School of Medicine.....(1929, 2)	2
Baylor University College of Medicine.....(1929)	1
University of Vermont College of Medicine.....(1929)	1
Medical College of Virginia.....(1929, 2)	2
University of Virginia Department of Medicine.....(1929)	1
Queen's University Faculty of Medicine.....(1926), (1927)	2
University of Toronto Faculty of Medicine.....(1917)	1
University of Vienna Faculty of Medicine.....(1921)*	1
University of Paris Faculty of Medicine.....(1928)	1
University of Breslau Faculty of Medicine.....(1921)*	1
National University of Athens Faculty of Med..(1922), (1909)*	2
Royal University of Bologna Faculty of Medicine.....(1927)*	1
Royal University of Naples Faculty of Medicine.....(1909)* (1923, 4), (1926), (1927, 2)*.....	8
Royal University of Padua Faculty of Med...(1917),* (1917)	2
Royal University of Palermo Faculty of Med..(1920), (1921)	2
Royal University of Rome Faculty of Medicine.....(1923)*	1
School of Medicine and Pharmacy, Pueblo.....(1920)*	1
University of Kharkov Faculty of Medicine.....(1912)*	1
University of Kiev Faculty of Medicine.....(1914)*	1
University of Odessa Faculty of Medicine.....(1922)	1
University of Moscow Faculty of Medicine.....(1920)*	1
University of Zurich Faculty of Medicine.....(1928)*	1
University of Stamboul Faculty of Medicine.....(1919)*	1
Osteopaths	9

ENDORSEMENT OF CREDENTIALS

College	Year Grad.	Endorsement of
University of Arkansas School of Medicine	(1925)	New Jersey
College of Medical Evangelists	(1927)	California
University of California Medical School	(1921)	California
College of Physicians and Surgeons, Los Angeles	(1918)	California
University of Colorado School of Medicine	(1897)	California
Yale University School of Med..(1898) Connecticut,	(1927)	N. B. M. Ex.
Atlanta Medical College	(1914)	Georgia
Northwestern University Medical School	(1922)	Minnesota
Rush Medical College...(1906) Illinois,	(1924)	N. B. M. Ex.
Indiana University School of Med..(1917), (1926), (1928, 2)		Indiana
University of Louisville School of Medicine	(1928)	N. B. M. Ex.
College of Physicians and Surgeons, Boston	(1910)	Porto Rico
Johns Hopkins University School of Medicine...(1911) (1920) Maryland, (1925) Virginia, (1926), (1927)		N. B. M. Ex.
University of Maryland School of Medicine...(1912) (1925) Porto Rico, (1926), (1927) Maryland		Texas
Harvard Univ. Med. School..(1901) Mass., (1892) †, (1908) (1915) Ohio, (1923) Montana, (1925, 2), (1926, 3), (1927, 3), (1928) N. B. M. Ex.		Indiana
Tufts College Medical School...(1907), (1917), (1923) (1920) Maine		Mass.
Detroit College of Medicine and Surgery	(1890)	†
University of Michigan Medical School	(1912)	California
Univ. of Minn. Med. Sch...(1921), (1925), (1927), (1929‡)		Minnesota
St. Louis University School of Medicine...(1908) (1927), (1928) N. B. M. Ex.		Oklahoma
Washington University School of Medicine	(1923)	Missouri
Columbia Univ. College of Physicians and Surgeons...(1903) (1925), (1927, 2), (1928) N. B. M. Ex.		Oregon
Cornell University Medical College	(1924)	N. B. M. Ex.
University and Bellevue Hospital and Med. College..(1928)		N. B. M. Ex.
Cleveland College of Physicians and Surgeons	(1909)	Ohio
Medical College of Ohio	(1897)	Mass.
Ohio Medical University	(1904)	Nevada
Ohio State University College of Medicine....(1925), (1928)		Ohio
University of Cincinnati Coll. of Med..(1923), (1925), (1927)		Ohio
Hahnemann Med. College and Hosp., Philadelphia....(1896)		Penna.
Jefferson Medical College...(1908), (1922)		Penna.
Medico-Chirurgical College of Philadelphia	(1901)	Tennessee
University of Pennsylvania School of Med..(1887) †, (1895) (1919), (1925) N. Carolina, (1924), (1927) N. B. M. Ex.		Penna.
University of Pittsburgh School of Medicine	(1921)	N. B. M. Ex.
Medical College of the State of South Carolina	(1925)	N. Carolina
University of Tennessee College of Medicine	(1923)	Tennessee
Vanderbilt Univ. School of Med....(1920) Kentucky,	(1928)	Tennessee
Baylor University College of Medicine	(1924)	Texas
University of Texas School of Medicine	(1917)	Texas
University of Vermont College of Med..(1920) Conn.,	(1921)	Mass.
Medical College of Virginia.....(1916) Maryland, (1923), (1927) Virginia	(1924)	Porto Rico
University of Virginia Department of Medicine...(1899), (1921), (1927) Virginia	(1892)	Mass.
Marquette University School of Medicine	(1923)	Wisconsin
McGill University Faculty of Medicine	(1927)	N. B. M. Ex.
Queen's University Faculty of Med..(1919, 2) Canada,	(1927)	Wisconsin
University of Toronto Faculty of Medicine	(1914)	Canada
University of Berlin Faculty of Medicine	(1923)*	Maryland
University of Kiel Faculty of Medicine	(1923)*	†
University of Palermo Faculty of Medicine	(1922)	New Jersey
National University of Mexico Faculty of Medicine	(1903)*	Mexico
University of Moscow Faculty of Medicine	(1917)*	†
University of Petrograd Faculty of Medicine	(1913)*	California
University of Sartov Faculty of Medicine	(1914)*	Mass.
Novozosisky University Faculty of Medicine	(1917)*	†
University of St. Vladimir Faculty of Medicine	(1918)*	Mass.
University of Barcelona Faculty of Medicine	(1880)*	†
University of Basel Faculty of Medicine	(1924)	California
University of Geneva Faculty of Medicine	(1913)*	†
University of Lausanne Faculty of Medicine	(1901)*	Missouri
Osteopaths	(1)	New Jersey

* Verification of graduation in process.
† Diploma endorsed.
‡ Applicant has received M.B. degree and will receive M.D. degree on completion of one year's internship in a hospital.

California October Examination

Dr. Charles B. Pinkham, secretary of the Board of Medical Examiners of the State of California, reports the written examination held at Sacramento, Oct. 22-24, 1929. The examination covered 9 subjects and included 90 questions. An average of 75 per cent was required to pass. Sixty candidates were examined, 55 of whom passed and 5 failed. One hundred and thirty-four physicians were licensed through reciprocity with other states and 11 by the endorsement of credentials. The following colleges were represented:

PASSED

College	Year Grad.	Number Passed
College of Medical Evangelists..(1927, 1), (1928, 1),	(1929, 6)	8
Stanford University School of Medicine...(1928, 1),	(1929, 2)	3
University of California Medical School..(1928, 1),	(1929, 2)	3
University of Colorado School of Medicine	(1929, 1)	1
Yale University School of Medicine	(1926, 1)	1
Northwestern University Medical School..(1927, 1),	(1929, 3)	4
Rush Medical College	(1929, 5)	5
Univ. of Illinois Coll. of Med...(1922, 1), (1924, 1),	(1929, 2)	4
State University of Iowa College of Medicine	(1928, 1)	1
University of Louisville School of Medicine	(1927, 1)	1
Johns Hopkins University School of Med..(1928, 1),	(1929, 1)	2
Boston University School of Medicine	(1928, 1)	1
Harvard Univ. Med. School....(1924, 1), (1925, 1),	(1929, 1)	3
University of Minnesota Medical School	(1929, 1)	1
St. Louis University School of Medicine	(1929, 2)	2
Washington University School of Medicine	(1929, 2)	2
Creighton University School of Medicine	(1929, 4)	4
University of Nebraska College of Medicine	(1929, 1)	1
University of Buffalo School of Medicine	(1928, 1)	1
Ohio State University College of Medicine	(1926, 1)	1
Jefferson Medical College	(1929, 1)	1
University of Pennsylvania School of Medicine	(1929, 1)	1
McGill Univ. Faculty of Med...(1920, 1), (1926, 1),	(1929, 1)	3
Royal University of Siena Faculty of Medicine	(1928, 1*)	1

FAILED

College	Year Grad.	Per Cent
College of Physicians and Surgeons, Boston	(1916)	66.3
Creighton University School of Medicine	(1929)	73.6, 73.9
University of Guadalajara Faculty of Medicine	(1928)*	25.3
Charles University of Prague Faculty of Medicine	(1921)*	57

LICENSED BY RECIPROCITY

College	Year Grad.	Reciprocity with
University of Colorado School of Medicine...(1911, 2) (1919), (1925), (1926), (1928, 2)		Colorado
George Washington University Medical School	(1915)	Wisconsin
Howard University School of Medicine	(1928)	Dist. Colum.
American Medical Missionary College, Chicago	(1901)	Michigan
Chicago Homeopathic Medical College	(1895)	Texas
Hahnemann Med. College and Hospital of Chicago	(1914)	Illinois
Hering Medical College, Chicago	(1904)	S. Dakota
Loyola University School of Medicine	(1926)	Indiana
Northwestern Univ. Med. School..(1896) Nebraska, (1899) S. Dakota, (1926) Washington, (1902),	(1902) (1926)	Illinois Wisconsin
Northwestern University Women's Medical School	(1898)	Minnesota
Rush Medical College...(1906) Washington, (1911), (1897) Iowa, (1918) S. Dakota, (1902) Idaho, (1917) Utah	(1917)	Illinois
University of Illinois School of Medicine...(1918) Iowa, (1907), (1915), (1920, 2) Illinois	(1903)	Montana
Indiana University School of Medicine	(1926), (1927)	Indiana
State University of Iowa College of Med...(1905), (1922)		Iowa
Kansas Medical College...(1904) Kansas,	(1909)	Montana
University of Kansas School of Medicine...(1906),	(1917)	Kansas
Tulane Univ. of Louisiana School of Med...(1924),	(1926)	Louisiana
Baltimore Medical College	(1905)	Washington
Johns Hopkins University School of Medicine...(1920), (1922), (1923), (1926, 3) Maryland	(1914)	Montana
Harvard University Medical School	(1926)	Maryland
Tufts College Medical School	(1919), (1922)	Mass.
University of Michigan Medical School...(1908), (1916), (1920), (1922), (1925, 3), (1927) Michigan	(1918)	Oregon
University of Minnesota Medical School...(1906, 2), (1925), (1928) Minnesota	(1925)	N. Dakota
St. Louis University School of Med..(1908) Florida, (1925) Illinois, (1921), (1927), (1928, 2) Missouri	(1909)	Utah
University Medical College of Kansas City	(1897)	Illinois
Washington Univ. School of Med....(1904), (1919),	(1925)	Missouri
University of Nebraska College of Medicine...(1905) S. Dakota, (1920), (1927) Nebraska	(1905)	Wyoming
Creighton University School of Medicine...(1926) Iowa, (1901), (1906), (1923) Nebraska	(1927)	Utah
Columbia University College of Phys. and Surgs	(1914)	New York
Cornell University Medical College	(1927)	New York
Syracuse University College of Medicine	(1909)	New York
University of Buffalo School of Medicine	(1925)	New York
Eclectic Medical College of Cincinnati	(1928)	Ohio
Ohio State University College of Medicine	(1928)	Ohio
Univ. of Cincinnati Coll. of Med..(1923), (1928),	(1929, 2)	Ohio
Western Reserve University School of Medicine...(1921), (1925), (1928)	(1918)	Ohio
University of Oklahoma School of Medicine	(1923)	Oklahoma
University of Oregon Medical School...(1906), (1917), (1922), (1925) Oregon	(1925)	Michigan
Hahnemann Med. Coll. and Hosp. of Philadelphia	(1915)	Penna.
Jefferson Medical College...(1890) Illinois, (1927) N. Jersey, (1928) N. Carolina	(1910)	Utah
University of Pennsylvania School of Medicine...(1900) Oregon, (1925) Wisconsin, (1925), (1927)	(1912)	Penna.
Western Pennsylvania Medical College	(1905)	Penna.
Chattanooga Medical College	(1909)	Illinois
Meharry Medical College	(1919)	Georgia
Memphis Hospital Medical College	(1911)	Kentucky
University of Tennessee College of Medicine..(1922),	(1928)	Tennessee
Vanderbilt University School of Medicine	(1919, 2)	Tennessee
Baylor University College of Medicine...(1928, 2)		Texas

College	Year Grad.	Endorsement with
University of Virginia Department of Medicine	(1896)	Arizona
McGill University Faculty of Medicine	(1924)	Maryland
Trinity Medical College	(1904)	N. Dakota
University of Toronto Faculty of Medicine	(1913)	Washington
University of Western Ontario Faculty of Medicine	(1924)	Wisconsin

ENDORSEMENT OF CREDENTIALS

College	Year Grad.	Endorsement with
College of Medical Evangelists	(1927),	(1929) N. B. M. Ex.
Yale University School of Medicine	(1927)	N. B. M. Ex.
George Washington University Medical School	(1912)	U. S. Army
Chicago College of Medicine and Surgery	(1916)	U. S. Navy
University of Illinois School of Medicine	(1928)	U. S. Navy
University of Kansas School of Medicine	(1921)	U.S.P.H.S.
Harvard University Medical School	(1923)	N. B. M. Ex.
Creighton University School of Medicine	(1905)	U. S. Navy
University of Pennsylvania School of Medicine	(1926)	N. B. M. Ex.
University of Tennessee College of Medicine	(1927)	U. S. Navy

* Verification of graduation in process.

Book Notices

THE VOLUME OF THE BLOOD AND PLASMA IN HEALTH AND DISEASE. By Leonard G. Rowntree, M.D., and George E. Brown, M.D., Division of Medicine, the Mayo Clinic and the Mayo Foundation, Rochester, Minn. With the technical assistance of Grace M. Roth. Cloth. Price, $3 net. Pp. 219, with illustrations. Philadelphia: W. B. Saunders Company, 1929.

In this monograph the authors are successful in achieving their purpose; namely, to arouse an interest in the practical significance of variations in the volume of the blood. There is a searching evaluation of the dye method in the light of published criticisms and a discussion of the large mass of data obtained by the authors on normal individuals under basal conditions. Formulas for the prediction of blood volume are given and the surprising statement is made that "blood volume in relation to body surface must be one of the most constant features of the human body." The data presented for the blood volume in various diseases indicate that, although this determination may not come into common use in routine clinical examination, it not only may be of diagnostic value but also promises to yield much information on the pathogenesis of some of the conditions studied. The relative parts played by cells and plasma in alterations of blood volume are well brought out by the lucid discussion and by the excellent charts; and a rational system of nomenclature is suggested. Whereas the uniformity of the composition of the plasma has long been recognized, the essential constancy of the volume of the plasma in normal individuals is emphasized by the studies that form the basis of the book. Even in disease, such variations in blood volume as have been demonstrated are due largely to changes in the mass of circulating erythrocytes. The monograph is a distinct contribution to a field somewhat off the beaten track of clinical interest.

HANDBUCH DER MIKROSKOPISCHEN ANATOMIE DES MENSCHEN. Herausgegeben von Wilhelm v. Möllendorff. Band I. Die lebendige Masse. Teil 2: Wachstum und Vermehrung der lebendigen Masse. Von Dr. F. Wassermann, Professor an der Universität, München. Paper. Price, 148 marks. Pp. 807, with 464 illustrations. Berlin: Julius Springer, 1929.

This is devoted to cells and certain of their rôles in the development and functioning of tissues. G. Hertwig has written a monumental treatise on the internal anatomy of the cell, surveying every phase of the subject from the modern physiologic point of view and with an authoritative, critical acumen. Faults are so rare that to mention them would unduly magnify their importance. He adopts the theory that cellular activity is the product of the interaction of qualitatively different units (protomeres of Heidenhain) which, although ultramicroscopic, are yet more or less segregated as the organs of the cell. An historical survey is followed by a critical consideration of methods. His presentation of the effects of fixing fluids on living protoplasm and of the nature of staining processes should serve to inhibit the production of much rubbish such as now encumbers cytologic literature. The discussions of intracellular structures, of speculations concerning cellular movements and of the evidences of intracellular metabolism are exhaustive. It is surprising, perhaps, to find that the material of which the Nissl substance is an example is described as "deutoplasmic." Studnička's section on the organization of living substance begins with the development of microscopic anatomy and cell theory from the seventeenth century on, written with an intimate first-hand knowledge of this literature. The bulk of the section is devoted to evidences of protoplasmic continuity among cells of the same and of different tissues. It covers a wide range of material but is entirely uncritical as to the methods employed in obtaining evidence, and no use is made of the facts of colloidal chemistry. Protoplasmic continuity through an extracellular living substance is regarded as an important factor in the establishment of the individuality of the organism. Tschopp's section is a presentation of the methods and results of incinerating microscopic sections for a study of the distribution of inorganic constituents within cells. This is an intriguing method of attack. Part II is Wassermann's treatise on growth and reproduction in cells. Mitosis (including maturation divisions) and the factors that influence them are considered in great detail (495 pages) from the dynamic point of view. No significant observations are omitted, but it is necessary to admit that the fundamental problems of growth remain unanswered. The question of amitosis is presented without the usual bias of theoretical preconceptions. Cell differentiation is discussed largely from the histogenetic point of view, and particular attention is paid to the fibers of connective and muscular tissue. The final chapter deals with the theories of cellular differentiation and has a suggestive discussion of the part which intra-organic mechanical factors, and the like, play in histogenesis. Each section in both volumes is accompanied by an exhaustive bibliography, and the indexes are excellent.

THE STORY OF SAN MICHELE. By Axel Munthe. Cloth. Price, $3.75. Pp. 530. New York: E. P. Dutton & Company, 1929.

The medical autobiographies that have become classic are already considerable in their number. Indeed, Garrison in the third appendix of his notable "History of Medicine" indicates references to more than a score of important contributions of this character. Of the intimate biographies there are such classics as Pasteur, Metchnikoff, Osler, Paré and Trudeau. The book by Dr. Axel Munthe differs from all of these in several attributes, primarily in its literary style but also because of the special character of the author's life and practice.

After intimate association with the famous French neurologist Charcot, who is of course noted particularly for his research on hypnotism, Munthe established himself as a physician to the society of Paris. He found soon enough that many of the social lights wanted not so much a scientific diagnosis as a prescription that would involve vacations more or less permanent.

He had had from youth a craving for a home in Italy. During his residence in Paris he associated himself a great deal with the care of the poor in an Italian colony. He must have been in contact with the research of Pasteur on rabies, and he gives a picture of a battle between himself and a crazed Russian patient as dramatic as any of the pictures in current fiction. Indeed, there is also in this work dramatization of the warfare of the physician against diphtheria and cholera which makes vivid the terrible trials of the physician of an earlier day against these afflictions of mankind. Ultimately, Munthe, as do most physicians, broke under the burdens that he had to bear.

Munthe seems to have had in his character something which gave him a special ability in gaining the confidence of animals. He describes visits to the zoo and incidents associated with the care of dogs and monkeys which emphasize the highly important fact that the physician who can employ the lower animals in research for the good of mankind may still retain a tender heart and a natural sympathy for the lower animals, in its spiritual quality far beyond the silly emotionalism manifested by the fanatical antivivisectionists. Eventually, worn by his practice, Munthe retired to the city of Rome and at last purchased the retreat known as San Michele. There he established himself, surrounded by relics of ancient Roman civilization, and there he founded a retreat for the animals and birds that he loved so well. In this connection it is striking to note that the profits from the sale of this book are to be turned over to the Society of Naples for the Protection of Animals.

The book ends on a highly mystical note, as though the author were striving for romance. The facts of his life have been presented so vividly and romantically that any rhetorical striving is entirely unnecessary. The book is one which may

be read by all for its humor, its inspiration and its drama, but which the physician particularly will read because it offers a sympathetic interpretation of his own life to the general public.

CHIRURGIE DES OS ET DES ARTICULATIONS DES MEMBRES. Par P. Lecéne, professeur a la Faculté de médecine de Paris. Avec la collaboration de P. Huet, chirurgien des Hôpitaux de Paris. Cloth. Price, 140 francs. Pp. 591, with 337 illustrations. Paris: Masson & Cie, 1929.

This gives extended consideration to surgery of the bones and joints in the light of experience gained in the war. The book is divided into eight sections. In the first section the operative treatment of various types of fractures is considered, with the indications for each particular region. The early advantages of débridement in certain types of compound fractures are pointed out and various methods and indications for osteosynthesis are discussed. The osteoperiosteal graft is recommended frequently, although foreign material is still favored in many conditions. In the second section, acute and chronic types of osteomyelitis are considered, with their treatment. Conservative local drainage or even subperiosteal incision in early stages or in those critically ill is advocated. In the third section, parasitic cysts and bone dystrophies are included, with the tumors. Conservative treatment is advised except for malignant conditions. In the fourth section, under joint infections, injuries and their complications, the authors emphasize the necessity of frequent resection or hemiresection in the more serious suppurative types in order to facilitate drainage. The functional end-results, especially in the wrist and ankle and perhaps also in the hip, are often satisfactory. The authors advocate arthrotomy and rigid temporary immobilization in plaster for the acute grave infections of the joint, followed by early mobilization, in preference to the immediate mobilization of Willems. In the sixth section, amputations with a consideration of their indications and operative technic are considered. The illustrations throughout the sections on operative technic are unusually good. In the seventh section, classic resections of the bones and joints in each region are taken up in detail. The choice of operation is discussed, with emphasis on the functional end-result. The eighth section includes a brief discussion of the surgical treatment of several commonly seen congenital and acquired deformities. The text is clear and concise and covers the subject in a most satisfactory manner.

BIOLOGICAL STAINS: A HANDBOOK ON THE NATURE AND USES OF THE DYES EMPLOYED IN THE BIOLOGICAL LABORATORY. By H. J. Conn, New York Agricultural Experiment Station. Prepared with the collaboration of J. A. Ambler, S. I. Kornhauser, F. B. Mallory, and L. W. Sharp. Second edition, enlarged and revised with the assistance of W. C. Holmes, and R. W. French and other members of the Executive Committee. Cloth. Price, $3. Pp. 224, with illustrations. Geneva, N. Y.: Commission on Standardization of Biological Stains, 1929.

This edition comes four years after the first. During these four years so much has been added to the knowledge of stains and staining that it has been necessary largely to rewrite the book. A good deal of new material has been added. Staining formulas and procedures for staining are given in detail under various dyes, but staining methods could not all be included without expanding the book into a complete work on microscopic technic. The procedures outlined in the book are limited to those that have been used by the members of the commission and found to give good results with modern American stains. The investigations of the commission have been supported by the Chemical Foundation. The work of the commission on standardization of biologic stains, as represented in this book, which should be found in all biologic laboratories, is of great practical value.

RENALER UND INSULÄRER DIABETES. Von Prof. Dr. W. Falta. Paper. Price, 5 marks. Pp. 106, with 43 illustrations. Berlin: Urban & Schwarzenberg, 1930.

This book is apparently the result of a long and painstaking study of the subject. Case histories, profusely illustrated by tables and charts, rather than theorizing, comprise its bulk. Evidence is presented to show that the usual clinical criteria of renal diabetes, such as the independence of the glycosuria from the carbohydrate in the diet, the unprogressive and harmless nature of the condition, and its resistance to insulin, may lead to errors in diagnosis. The data presented are chiefly based on simultaneous studies of venous and arterial (capillary) blood sugar values of patients given various amounts of carbohydrate or insulin. The author's style is simple and direct and makes for easy reading.

BERGEY'S MANUAL OF DETERMINATIVE BACTERIOLOGY: A KEY FOR THE IDENTIFICATION OF ORGANISMS OF THE CLASS SCHIZOMYCETES. By David H. Bergey, assisted by a Committee of the Society of American Bacteriologists, Francis C. Harrison, Robert S. Breed, Bernard W. Hammer, Frank M. Huntoon, with an index by Robert S. Breed. Third edition. Cloth. Price, $6. Pp. 589. Baltimore: Williams & Wilkins Company, 1930.

The complexity of scientific problems is exemplified in this elaborate system of classification of bacteria. Not long ago bacteria were classified by their morphology into a few simple classes, such as bacilli, cocci and spirilla. Today even this manual of nearly 600 pages is in no sense final but merely a progress report leading to a more satisfactory classification of bacteria in the future. Although published at the direction of the Society of American Bacteriologists, it is not official or standard and has not been formally approved by the society. In the present edition more than 200 additional organisms have been added and two additional tribes recognized, each containing a single genus representing important species of soil bacteria. The dysentery group has been separated from the typhoid group, the former group being placed in genus *Shigella* Castellani and Chalmers and the latter retained as genus *Eberthella*. The greater number of the newly described bacteria in this volume fall in genera *Flavobacterium, Pseudomonas, Phytomonas, Lactobacillus* and *Bacillus*. The committee in charge of the preparation of the manual desires the assistance of all bacteriologists in collecting data that can be used in making future revisions. The committee feels that intensive studies are needed on bacteria so that future classifications can be made on more detailed knowledge. Only then will it be possible to classify them on more definite biologic foundations. One becomes lost in this book unless he reads the suggestions in the preface on how to use the manual in classifying organisms. Then, he is reminded of high school or college days when, in the botany class, he was given a leaf or a flower and told to find out what it was.

UROLOGIE PRATIQUE. Par el Dr. P. Bazy. Paper. Price, 80 francs. Pp. 536, with 109 illustrations. Paris: Gauthier-Villars & Cie, 1930.

This is a compilation of the details of urologie practice employed by the author. While some of the personal views of this experienced urologist are interesting, this publication offers nothing that is not contained in the pertinent textbooks of former years. The illustrations are not up to American standards.

THE EYE IN GENERAL MEDICINE: The Constitutional Factor in the Causation of Diseases with Special Reference to the Treatment of Diseases of the Eye. By A. Maitland Ramsay, M.D., LL.D., Consulting Ophthalmic Surgeon, Glasgow Royal Infirmary. Second edition of "Diathesis and Ocular Diseases." Cloth. Price, $5 net. Pp. 255. New York: William Wood & Company, 1929.

Seemingly designed as a guide in ophthalmology for the general practitioner in medicine, this work emphasizes not the diagnosis of the ocular disease but rather the diagnosis of the underlying systemic condition, with especial attention to the specific gravity of the urine and to the importance of sending the patient to the seashore or the mountains. The diatribe against the valuation of modern laboratory observations must be sweet music in the ears of the old time general practitioner who believed in "laudable pus." Following each chapter, of which there are ten, is a short bibliography of references almost entirely British. The modern works on physiology of the eye that have emanated from other countries have evidently escaped the author's attention, although throughout the book he insists on the necessity of physiologic investigation of various ocular phenomena. The book consists of a mass of more or less uncorrelated statements dealing with the dependence of ocular disease on systemic disorders, illustrated inconclusively with poorly presented case reports. There is no excuse for such a text in scientific ophthalmology.

Medicolegal

Total Disability of a Surgeon

(United States Fidelity & Guaranty Co. v. McCarthy (U. S. C. C. A., Iowa), 33 Fed. (2d) 7)

McCarthy, a surgeon, accidentally fell, cutting his right hand and wrist and severing the median nerve. Under an accident policy, the United States Fidelity and Guaranty Company paid, as indemnity for total disability for one year following the injury, $13,000. Thereafter the insurer denied further liability. McCarthy sued and recovered $26,077.69 for continuous disability from Dec. 6, 1923, to Oct. 22, 1925. The insurer continued to deny liability, and McCarthy sued again, in October, 1926. By subsequent amendments to the complaint, the suit was made to cover indemnity from Oct. 22, 1925, to Feb. 23, 1928. The court instructed the jury to return a verdict for McCarthy for the full amount claimed by him, and judgment was entered on the verdict for $32,641.55. Thereupon, the insurer appealed to the United States Circuit Court of Appeals, eighth circuit.

The contention as to the correctness or incorrectness of the judgment of the trial court turned mainly on the effect of the judgment in the earlier case. McCarthy contended that the proceedings in the former case acted as an estoppel, preventing the relitigation of the issues tried and determined in that suit. The insurer denied this contention and pleaded that McCarthy's disability was no longer total, but partial. It was admitted by McCarthy that the present suit constituted a new and distinct cause of action; it related to indemnity for a different period. Where the second action between the same parties, said the court, is upon a different and distinct cause of action, the judgment in the earlier case is conclusive only as to those matters, questions and issues litigated and determined by it. The earlier case did not establish permanent total disability, nor that total disability would continue during the period for which indemnity was claimed in the second suit: the burden rested on the insured, McCarthy, to show continuous total disability during that period. Under the policy, the insurer might contest the question of total disability for every period it covers.

It was established by the judgment in the earlier case that during the period of time for which indemnity was awarded and at the termination of that period, McCarthy was totally disabled, within the terms of the policy; that is, that he was unable to perform any and every duty pertaining to his occupation as a surgeon. The position taken by McCarthy, said the court, is that the earlier case established his total disability under the policy until the insurer shows that he is no longer totally disabled. He obviously relied on the presumption that "proof of the existence at a particular time of a fact of a continuous nature gives rise to an inference, within logical limits, that it exists at a subsequent time." 22 C. J., 86. But, said the court, there is no inference that a fact so established will continue to exist for any definite period of time, and added:

> We do not think a presumption should be indulged that a highly educated, intelligent and healthy surgeon by virtue of an injury to his hand such as is here shown could not practice any substantial part of surgery at any time in the future because it had been determined that for some particular period he could not so do. Disability is not entirely a physical matter. Will power and condition of mind enter into it. A person may be disabled today, and in a year from now, without any change in the physical condition, not be disabled. A one-handed man may not be able to perform surgery today, and in a year from today may have overcome to some extent his disability and be able to perform some part of the substantial duties of a surgeon. If appellee's (McCarthy's) hand remains in the same condition for the years to come, it might be that he could do some surgical work, and it might be he could not. That is a question of fact to be determined for the period for which he seeks to recover indemnity. That his hand remains in the same condition is not conclusive that his disability also continues. Indemnity under the policy was for disability—not for injury to the hand. The question of any presumption is of little importance as a practical matter in this case.

The court held that the claimed estoppel by the previous judgment was not sufficient to establish McCarthy's total disability for the time covered by the second suit. The judgment of the court below was therefore reversed and the cause remanded.

Workmen's Compensation Act: Blastomycosis a Compensable Injury by Accident.—The evidence warranted the conclusion that the employee, in the course of his employment, contracted blastomycosis from a horse. The only question was whether the disease was an injury by accident within the meaning of the statutory definition:

> "Injury" and "personal injury" shall mean only injury by accident arising out of and in the course of employment, and shall not include a disease in any form except as it shall naturally result from the injury.

An accidental injury is not necessarily of traumatic origin. If it is an injury not reasonably to be foreseen, it is an accidental injury, whether it is caused by heat, germs or physical force. *McFarland* v. *Massachusetts Bonding & Ins. Co.* (Tenn.), 8 S. W. (2d), 369; *King* v. *Buckeye Cotton Oil Co.* (Tenn.), 296 S. W. 3. In *McFarland* v. *Massachusetts Bonding & Ins. Co.*, supra, a suit on an accident insurance policy, a bill was held to state a case which alleged that the complainant was injured by the entry of the germs of gonorrhea from some external source, with violence sufficient to impact themselves in the tissues of his eyes, by means unknown to him, and at a time and place unknown to him. The infection was deemed an accident within the meaning of the policy. In *King* v. *Buckeye Cotton Oil Co.*, supra, the Supreme Court of Tennessee was unable to find anything in the workmen's compensation act of the state that excludes from its operation any "injury by accident," even though the injury is made manifest by a condition of the body which medical science terms a "diseased" condition rather than a "traumatic" condition. Whether a particular infection is an accidental injury must be determined on the facts of the case. The facts in the present case were held to bring it fully within the statute as a compensable injury.—*Hartford Accident & Indemnity Co. v. Hay (Tenn.), 17 S. W. (2d) 904.*

Society Proceedings

COMING MEETINGS

Alabama, Medical Association of the State of, Montgomery, April 15-18. Dr. D. L. Cannon, 519 Dexter Avenue, Montgomery, Secretary.

American Association for the Study of the Feebleminded, Washington, D. C., May 5-10. Dr. H. W. Potter, Thiells, New York, Secretary.

American Association of Pathologists and Bacteriologists, New York, April 17-18. Dr. H. T. Karsner, 2085 Adelbert Road, Cleveland, Sec'y.

American Gastro-Enterological Association, Atlantic City, May 5-6. Dr. Charles G. Lucas, 321 West Broadway, Louisville, Secretary.

American Pharmacological Society, Chicago, March 27-29. Dr. E. D. Brown, University of Minnesota, Minneapolis, Secretary.

American Physiological Society, Chicago, March 26-29. Dr. A. C. Redfield, 240 Longwood Avenue, Boston, Secretary.

American Psychiatric Association, Washington, D. C., May 5-10. Dr. C. O. Cheney, Hudson River State Hospital, Poughkeepsie, N. Y., Sec'y.

American Society for Clinical Investigation, Atlantic City, May 5. Dr. Cyrus C. Sturgis, Simpson Memorial Institute, Ann Arbor, Mich., Sec'y.

American Society for Experimental Pathology, Chicago, March 26-29. Dr. Carl V. Weller, University of Michigan, Ann Arbor, Secretary.

American Society of Biological Chemistry, Chicago, March 26-29. Dr. H. B. Lewis, University of Michigan Medical School, Ann Arbor, Sec'y.

Arizona State Medical Association, Phoenix, April 17-19. Dr. D. F. Harbridge, 407 Goodrich Building, Phoenix, Secretary.

Arkansas Medical Society, Fort Smith, May 6-8. Dr. William R. Bathurst, 810 Boyle Building, Little Rock, Secretary.

Association of American Physicians, Atlantic City, May 6-7. Dr. James H. Means, Massachusetts General Hospital, Boston, Secretary.

California Medical Association, Del Monte, April 28-May 1. Dr. Emma W. Pope, 450 Sutter Street, San Francisco, Secretary.

District of Columbia, Medical Society of the, Washington, May 7-8. Dr. C. B. Conklin, 1718 M Street, N. W., Washington, Secretary.

Federation of American Societies for Experimental Biology, Chicago, March 26-29. Dr. A. C. Redfield, 240 Longwood Avenue, Boston, Sec'y.

Florida Medical Association, Pensacola, May 6-7. Dr. Shaler Richardson, 111 West Adams Street, Jacksonville, Secretary.

Hawaii Territorial Medical Association, Honolulu, April 26-28. Dr. A. N. Sinclair, Box 3373, Honolulu, Secretary.

Kansas Medical Society, Topeka, May 6-8. Dr. J. F. Hassig, Huron Building, Kansas City, Secretary.

Louisiana State Medical Society, Shreveport, April 29-May 1. Dr. P. T. Talbot, 1551 Canal Street, New Orleans, Secretary.

Maryland, Medical and Chirurgical Faculty of, Baltimore, April 22-23. Dr. John T. King, Jr., 1211 Cathedral Street, Baltimore, Secretary.

National Tuberculosis Association, Memphis, Tenn., May 7-10. Dr. C. J. Hatfield, Henry Phipps Institute, Philadelphia, Secretary.

North Carolina, Medical Society of the State of, Pinehurst, April 28-30. Dr. L. B. McBrayer, Southern Pines, Secretary.

Tennessee State Medical Association, Nashville, April 8-10. Dr. H. H. Shoulders, Lambuth Building, Nashville, Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American J. Pathology, Boston

6: 1-85 (Jan.) 1930

*Degenerative Changes in Male Germinal Epithelium in Acute Alcoholism and Possible Relationship to Blastophthoria. C. V. Weller, Ann Arbor, Mich.—p. 1.
Venous Drainage of Cat Spleen. W. L. Robinson, Toronto, Canada. —p. 19.
*Neuro-Epithelioma (Glioma) of Retina with Metastases. C. H. Hu, Peiping, China.—p. 27.
Origin of Perivascular Phagocytes of Granulation Tissue. F. A. McJunkin, Chicago.—p. 39.
*Metastatic Inoculation of Meningioma by Cancer Cells from Bronchiogenic Carcinoma. B. M. Fried, Boston.—p. 47.
Submaxillary Virus of Guinea-Pigs: II. Nuclear Cell, Nucleocytoplasmic and Inclusion-Nuclear Indexes of Affected Cells. G. H. Scott and B. S. Pruett, St. Louis.—p. 53.
*Changes in Thyroid Gland of Guinea-Pig Following Period of Administration of Potassium Iodide. J. Rabinovitch, St. Louis.—p. 71.
*Effect of Potassium Iodide on Thyroid Gland of Underfed Guinea-Pigs. J. Rabinovitch and S. H. Gray, St. Louis.—p. 75.
Metastatic Carcinoma in Spleen: Case. D. E. Dial, New Haven, Conn. —p. 79.

Degenerative Changes in Male Germinal Epithelium in Acute Alcoholism and Possible Relationship to Blastophthoria.—In the testes of nine men who died in a period of acute alcoholism, parenchymatous degeneration leading, when sufficiently marked, to practically complete aspermatogenesis was found by Weller. In the testes showing less severe changes there was an increase in spermatocytes and spermatids with a decrease in spermatozoa. As a more severe change this was followed by desquamation releasing free cells and masses of cells in the lumens of the tubules. Vacuolation of the cytoplasm, sometimes zonal in character, and in severe cases vacuolation of the nuclei, occurred. The vacuolated epithelium became reduced to but one to four layers of cells, only the basal layer being intact. Atypical cell divisions producing hyperchromatic giant nuclei and multinucleate teratocytes were numerous. These observations place clinically recognized, and experimentally induced, alcoholic blastophthoria on a morphologic basis.

Neuro-Epithelioma (Glioma) of Retina with Metastases.—Two cases of tumor of the eye, commonly known as glioma or neuro-epithelioma of the retina, are reported by Hu: one with metastases to the skull, skeletal bones, muscles, lymph nodes and meninges, and the other with extension to the brain, spinal cord and meninges. The embryonal character of these tumors and their analogy to certain tumors of the central nervous system are stressed.

Metastatic Inoculation of Meningioma by Cancer Cells from Bronchiogenic Carcinoma.—The case reported by Fried imitated closely the experiments of Ehrlich, of Apolant, and of Heiman. The bronchiogenic carcinoma invaded the meningeal new growth without being amalgamated with it, and retained therefore its individual characteristics. It grew actively, squeezing out the "host." The carcinomatous cells had split the solid rows of the meningioma, giving the impression that they were utilizing its cellular fibrils as a means of advance.

Changes in Thyroid Gland of Guinea-Pig Following Period of Administration of Potassium Iodide.—Experiments made by Rabinovitch show that the stimulating effects of potassium iodide on the growth activities of the thyroid gland are manifest approximately only during the time when this substance is being administered to the animal; proliferation begins to decline within a day or two following its last administration. While the number of mitoses in the thyroid is high immediately following the last dose of potassium iodide, this number approaches the normal count within from three to seven days later and seems to be reduced to a point below the normal from fourteen to thirty days later. Similarly, the other histologic changes in the thyroid are most marked in glands that have been removed immediately after the last iodide feeding, and the picture gradually returns to that of a normal gland as more time is allowed to elapse between the last iodide feeding and the removal of the thyroid gland.

Effect of Potassium Iodide on Thyroid Gland of Underfed Guinea-Pigs.—Experiments made by Rabinovitch and Gray illustrate that undernutrition plays an important rôle in the activity of the thyroid gland. The result is suppression of cell proliferation of the gland.

American J. Roentgenol. & Rad. Therapy, New York

23: 1-124 (Jan.) 1930

Primary Hemangioma of Bone. P. C. Bucy and C. S. Capp, Chicago. —p. 1.
*Intravenous Method of Cholecystography and Liver Function Test as Employed in Office Practice. C. A. Waters and J. H. King, Baltimore.—p. 34.
*Prevention of Reactions Following Oral Administration of Sodium Tetraiodophenolphthalein. J. H. Fitzgibbon, Portland, Ore.—p 44.
Roentgen Irradiation in Unresolved Pneumonia. E. A. Merritt and E. M. McPeak, Washington, D. C.—p. 45.
Radium and Radon Needles and Permanent Radon Implants. E. H. Quimby, New York.—p. 49.
Rational Method of Procedure in Irradiation of Malignant Tumors. L. R. Sante, St. Louis.—p. 57.
*Osteogenic Sarcoma: Case. R. Dresser and C. Dumas, Wrentham, Mass. —p. 65.
Thoracic Stomach: Case. C. G. Lyons, Hines, Ill.—p. 67.
Unusual Abdominal Tumor: Retroperitoneal Fibrosarcoma. P. H. Cook, Worcester, Mass.—p. 70.

Intravenous Method of Cholecystography and Liver Function Test as Employed in Office Practice.—Experience with the intravenous injection of phenoltetraiodophthalein has convinced Waters and King that the dye is comparatively nontoxic since few disagreeable reactions have been encountered and none of these were of an alarming nature. The method of injecting the dye is not technically difficult nor unusually time consuming, three injections being easily given in one hour. The cholecystograms are far superior to those obtained following the oral administration and the information gained from the films is more conclusive, because the intravenous administration insures the introduction of a definite amount of dye and is not complicated by factors of solution and absorption in the gastro-intestinal tract. In addition, the liver function can be simultaneously determined.

Prevention of Reactions Following Oral Administration of Sodium Tetraiodophenolphthalein.—Gastrointestinal reactions following the oral administration of sodium tetraiodophenolphthalein have been most commonly observed in patients suffering from colitis. Fitzgibbon states that diarrhea, cramps and nausea may be prevented by a small dose of opium from one-half to one hour before the dye is ingested. Increased absorption of the dye and improved visualization of the gallbladder may result from decreased peristaltic activity.

Osteogenic Sarcoma.—In August, 1914, a small osteochondroma was removed from the second metatarsophalangeal joint of the patient whose case is reported by Dresser and Dumas. He remained perfectly well until 1928, when he noticed a nontender swelling at the site of the old amputation. This increased rapidly in size. At this time a film of the chest showed no evidence of metastases. Mid-leg amputation was performed, and the patient was discharged from the hospital in January, 1929. The pathologic report on the specimen was a slowly growing bone sarcoma of a sclerosing type which probably originated from the bony and cartilaginous tumor removed in 1914. There was some similarity in the microscopic structure of the two growths. The patient returned in April, 1929, complaining of severe pain in the right side of the chest. A roentgenogram showed definite pulmonary metastases. The symptoms were not relieved by irradiation with high voltage roentgen rays. Routine roentgenographic examination of the entire skeleton and chest showed a pronounced increase in the extent of the pulmonary metastases, and in

addition there was discovered a pathologic process involving the first lumbar vertebra. This was thought to be due to metastatic malignancy. The patient failed rapidly, and death occurred May 20, 1929. Necropsy confirmed the roentgen observations. There were extensive pulmonary metastases, metastases in the right kidney, and a metastatic focus in the first lumbar vertebra.

Annals of Surgery, Philadelphia

91: 161-320 (Feb.) 1930

*Treatment of Aneurysms of Thoracic Aorta and Innominate Artery by Distal Arteriovenous Anastomosis. P. A. McCarthy, Philadelphia. —p. 161.
*Sanguineous Discharge from Nipple and Significance in Relation to Cancer of Breast. F. E. Adair, New York.—p. 197.
*Phrenic Nerve Surgery. C. R. Steinke, Akron, Ohio.—p. 210.
Esophageal Obstruction: Causes, Diagnosis and Surgical Treatment. N. W. Green, New York.—p. 214.
*Tests of Hepatic Function in Carcinoma: Value in Cases of Neoplasm of Colon With and Without Metastasis to Liver. J. A. Bargen and F. W. Rankin, Rochester, Minn.—p. 225.
Lipiodol Studies of Postoperative Biliary Fistulae. L. Ginzburg and E. W. Benjamin, New York.—p. 233.
*Spinal Anesthesia. S. J. Stabins and J. J. Morton, Rochester, N. Y. —p. 242.
*Spinal Anesthesia in Major Surgery. A. S. Jackson, Madison, Wis. —p. 256.
*Treatment of Gas Gangrene with Normal Horse Serum. D. H. Kling, Los Angeles.—p. 261.
Syphilis Among Southern Negro Males. R. A. Cutting, F. L. Loria and F. W. Pickell, New Orleans.—p. 269.

Treatment of Aneurysms of Thoracic Aorta and Innominate Artery by Distal Arteriovenous Anastomosis. —Ten cases are reported by McCarthy. Symptoms were apparent to the patients from a minimum duration of two months to a maximum duration of five years. Severe pain was the predominant complaint in each case. In nine cases it was centered in the thorax and in the other case it was in the neck and right shoulder. The pain was so acute in some cases that sleep, other than fitful, was impossible for a period of months. Large doses of morphine sulphate afforded no relief. All but one complained of dyspnea and cough, and in two dysphagia was a prominent symptom. Loss of weight was noticed in four cases; in one case the loss was more than 20 pounds (9 Kg.) within a period of six months. In four cases a visible pulsating tumor was present and a tracheal tug was evident in two cases. Only five of the ten cases showed a difference in blood pressure in the two arms; in two the patients were pulseless in one arm. The blood Wassermann reaction was positive in each case. All of the patients presented involvement of the aorta. Four patients showed an aneurysm of the innominate artery as well. At operation, the common carotid artery was considered as normal in only one case; in other cases it was thickened or calcified, or soft and mushy. In each case the marked and immediate relief of symptoms during operation was the outstanding feature. McCarthy considers the operation of arteriovenous anastomosis to be the operation of choice in aneurysm of the thoracic aorta and innominate artery. In conditions in which the location of an aneurysm, its size or technical difficulties are against an operation of direct attack on the carotid or subclavian arteries, this operation is to be considered. Two of the eight patients operated on died. One patient died on the table, as a result of the effect of nitrous oxide on an old syphilitic meningitis. One died as a result of apparent embolism, the embolus in all probability having come from the ligated end of the common carotid artery. Two patients died some time after the operations. One died suddenly, five weeks after the operation, while walking in the ward. The cause of death was given as cardiac failure, but was not proved by necropsy. The other patient was operated on while in a precarious condition and following the operation was apparently comfortable. He was greatly relieved of pain and dyspnea and there was marked improvement in the condition of his lungs, as confirmed by a roentgenogram. Death occurred in a paroxysm of coughing, about four weeks after the operation. Postmortem showed erosion of the aneurysm part way into the trachea, with almost complete occlusion just above the bifurcation of the trachea. The other four that were operated on and lived showed marked improvement.

Sanguineous Discharge from Nipple and Significance in Relation to Cancer of Breast.—Adair's study based on 108 cases of bleeding nipple demonstrates cancer in 47.2 per cent, and a benign condition in 52.8 per cent. The syndrome of a bloody discharge from the nipple is therefore of great clinical importance. Microscopic study of the smear from the discharge is of decided value, particularly in excluding many cases which appear to show bloody discharge but which on a microscopic study prove not to. Two hundred such cases were excluded from this report. Transillumination of the breast is of great help in making a differential diagnosis and in locating the offending lesion. Bleeding tumors are opaque to transillumination. External irradiation by two high voltage roentgen treatments or by one radium pack of 10,000 millicurie hours stopped the bleeding in 50 per cent of the cases. However, bleeding ceased temporarily. Bacteriologic studies of the discharge were negative, ruling out a bacterial origin of etiology. In the eighty-nine patients operated on, bleeding ceased in 95 per cent. Fifty-two per cent of patients with bleeding nipple are cured by the simplest type of surgery. Adair regards extirpation as being important preventive cancer surgery.

Phrenic Nerve Surgery.—Steinke urges that phrenicotomy and exeresis should be performed more often and earlier when pulmonary tuberculosis is limited mostly to one side. These operations will not supplant pneumothorax, but should be used more often in conjunction with pneumothorax when the latter causes distress, has to be repeated too frequently or under fair trial does not effect the desired result. Of thirty-five phrenicectomies reported, only two failed to give any benefit.

Treatment of Hepatic Function in Carcinoma.—Bargen and Rankin present a review of 116 consecutive cases of carcinoma of the colon and rectum studied in regard to the value of bromsulphalein tests, the van den Bergh reaction and the estimation of bilirubin content of the serum as evidence of metastatic implantation in the liver. In about 50 per cent of patients with extensive hepatic metastasis, proved surgically, metastasis was suspected from the general examination. Retention of dye in these cases was usually marked. There were other cases in which the liver was not palpable, even with deep inspiration, but in which the surgeon found the liver riddled with metastatic lesions and in which there had been a high degree of retention of dye before operation. It seems evident, then, that the test of hepatic function may add valuable information to confirm a clinical suspicion and also that it may raise suspicion and urge one to exhaust all clinical means of diagnosis of a metastasis to the liver.

Spinal Anesthesia.—From reports in the literature and as a result of their own studies, Stabins and Morton conclude that spinal anesthesia is especially useful as follows: 1. For technical advantages—especially in gallbladder and pelvic operations; in noninflammatory conditions of the stomach and intestines, in early intestinal obstruction; in obese individuals with ventral hernias (these patients take inhalation anesthesia poorly). 2. For major surgery in diabetes—because there is no disturbance in routine treatment and a sparing of the kidneys and general metabolism. 3. For major surgery of the extremities. 4. For abdominal surgery in the presence of active or arrested pulmonary tuberculosis. If marked hypotension is present, other forms of anesthesia should be selected. 5. To avoid a certain amount of postoperative discomfort, especially nausea, vomiting, gas pains and distention. 6. As a treatment for paralytic ileus not associated with inflammation or mechanical block.

Spinal Anesthesia in Major Surgery.—Jackson is an ardent advocant of spinal anesthesia, when properly administered. He says that it offers the safest anesthetic from the standpoint of the patient and the most ideal one for the comfort of the surgeon. Among the 1,000 anesthesias reported on by him there were fifty complications: mild distention in twenty-five cases; headache in fifteen; transient paresthesia in four; pneumonia (aspiration) in one, and phlebitis in one. In two cases the needle broke but was removed successfully. The operations performed included appendectomies, cholecystectomies, perineal and rectal operations, cystoscopic examinations,

pelvic laparotomies, hernias (all types), gastric and duodenal resections, orthopedic operations (leg, hip and spine), cystoscopies and prostatectomies and radical breast amputations.

Treatment of Gas Gangrene with Normal Horse Serum.—Four cases of severe gas gangrene treated with normal horse serum are reported by Kling. The clinical observations in this material suggest a detoxicating effect. Horse serum does not neutralize *Bacillus welchii* toxin and therefore does not protect pigeons against this toxin. Its action is based on unspecific destruction of the toxin. Commercial brands of *Bacillus welchii* (perfringens) toxin were found to possess high titer (0.01 cc. per hundred grams of pigeon was sufficient to protect against an absolute lethal dose of toxin). From 10 to 20 cc. of this serum, repeated according to the progress, should therefore be effective against the toxemia of gas gangrene caused by *Bacillus welchii*.

California & Western Medicine, San Francisco

32: 73-144 (Feb.) 1930

Cost of Medical Care and Hospitalization. A. B. Cooke, Los Angeles.—p. 73.
*Acute Upper Respiratory Tract Infections in Children. C. Sweet, Oakland.—p. 74.
*Heart Disease: Modern Diagnosis. L. E. Viko, Salt Lake City.—p. 78.
*Blood Picture in Hodgkin's Disease. E. H. Falconer, San Francisco.—p. 83.
*Systemic Blastomycosis. G. D. Maner and R. W. Hammack, Los Angeles.—p. 87.
Tuberculosis Clinic for Children. L. B. Dickey, San Francisco.—p. 90.
*Anesthesia for Children. J. R. Martin, Los Angeles.—p. 93.
Carcinoma of Uterus: Treatment by Radiation. A. Soiland and W. E. Costolow, Los Angeles.—p. 95.
Stenosing Tendovaginitis of De Quervain: Case. J. T. Watkins and H. C. Pitkin, San Francisco.—p. 101.
*Hemochromatosis: Case. M. K. Tedstrom, Anaheim.—p. 102.
Foreign Bodies in Ureter. W. E. Stevens, San Francisco.—p. 104.
Medical Books of Famous Printers. C. D. Leake, San Francisco.—p. 106.
Toxic Amblyopia. E. L. Creveling, Reno, Nev.—p. 110.
Rupture of Uterus. W. J. Blevins, Woodland.—p. 111.
Phenobarbital: Rash and Other Toxic Effects. S. H. Babington, Berkeley.—p. 114.

Acute Upper Respiratory Tract Infections in Children.—Sweet concludes that acute infections, the area of invasion being usually within the upper respiratory tract, are responsible for many departures from a healthy state in children. Loss of appetite, fever, vomiting, diarrhea, abdominal pain and convulsions are the usual symptoms and signs of such acute infection.

Modern Diagnosis in Heart Disease.—Viko analyzes the causes of 700 cases of heart disease reported from the state of Utah and compares the incidence with that reported from New England and the state of Virginia. The incidence for rheumatism was: Utah, 42.27 per cent; New England, 31.8 per cent; Virginia, 21.98 per cent; for arteriosclerosis: Utah, 21.57 per cent; New England, 28.8 per cent, and Virginia, 45.66 per cent; for hypertension: Utah, 13.13 per cent; New England, 23.6 per cent, and Virginia, 45.98 per cent; for hyperthyroidism: Utah, 9.13 per cent; New England, 2.26 per cent, and Virginia, 3.66 per cent; for syphilis: Utah, 6.14 per cent; New England, 2.7 per cent, and Virginia, 2.33 per cent. Analyzing the symptoms manifested in three groups of cases, valvular disease, neurosis and valvular disease with neurosis, he found the incidence to be as follows: dyspnea, 62 per cent, 76 per cent and 91 per cent; palpitation, 44 per cent, 86 per cent and 91 per cent; precordial pain, 20 per cent, 52 per cent and 52 per cent; dizziness, 7 per cent, 40 per cent and 74 per cent; fainting, 3 per cent, 26 per cent and 34 per cent; numbness or tingling, 4 per cent, 18 per cent and 48 per cent.

Blood Picture in Hodgkin's Disease.—The results of Falconer's blood studies in Hodgkin's disease conform in a general way to the results and conclusions worked out by Banting several years ago. This analysis substantiates the idea that later in the disease, beyond the first year, the leukocyte count tends to become increased, with an increase in the polymorphonuclear leukocytes. Also there is an average and fairly constant increase in the mononuclear cells. The platelet counts are not high, as other authors have found them. The eosinophil count averages about normal or below but may occasionally be high, reaching in one instance 80 per cent of the total leukocytes.

Systemic Blastomycosis.—Two cases of systemic blastomycosis with necropsy observations are reported by Maner and Hammack. They illustrate the variability of the distribution of the lesions in different cases.

Anesthesia for Children.—While favoring ethylene as an anesthetic, Martin says that each anesthetic agent has its merits and its shortcomings. In this type of work the anesthetic of most merit and best suited for the individual case should be used. The physical and mental condition of the child on entering the operating room, the care and skill used in administering the anesthetic, the length of time and the severity of the operation are all important points to be noted just as in adult anesthesia. The proper handling of the patient, both before and during the anesthetic, is as important as the type of anesthetic used.

Hemochromatosis.—A case of hemochromatosis, proved by the finding of hemosiderin in the skin, in the urine sediment, and in the liver section removed at the time of operation is reported by Tedstrom. This patient had a history of both chronic alcoholism and possible chronic brass poisoning, both of which are theoretical causes of hemochromatosis. Omentopexy was done on this patient with remarkable improvement in his condition, so much so that he was able to return to his work. The literature does not reveal any previous case of hemochromatosis in which an omentopexy was done for relief of the ascites. The history suggests definitely that the pigmentary change was the primary lesion, being followed by cirrhosis of the liver and ascites.

Delaware State M. Journal, Wilmington

2: 1-18 (Jan.) 1930

Treatment of Syphilis in Light of Modern Advances. J. F. Schamberg, Philadelphia.—p. 1.
Diagnosis and Management of Acute Mastoiditis. J. E. Brayshaw, Wilmington.—p. 6.

Illinois Medical Journal, Oak Park

57: 73-144 (Feb.) 1930

Interdependence of Suprarenals, Thyroid Gland and Sympathetic Nervous System with Clinical Application. G. W. Crile, Cleveland.—p. 97.
Clinical Investigation and Practitioner of Medicine. N. S. Davis III, Chicago.—p. 101.
State Health Director Reports on Serious Smallpox Situation in Illinois. A. Hall, Springfield.—p. 106.
A B C of Electrocardiogram. E. Keating, Chicago.—p. 107.
*Relief of Projectile Vomiting in Infants by Radiation of Upper Chest Region. O. Barbour and J. W. Connell, Peoria.—p. 110.
Clinical Roentgenology. M. J. Hubeny, Chicago.—p. 120.
Dermatologic Aspects of Early Syphilis. C. White, Chicago.—p. 123.
Intra-Ocular Hypertension and Internist. C. W. Geiger and J. H. Roth, Kankakee.—p. 128.
*Transfusion of Whole Blood in Treatment of Acute Hemolytic Streptococcic Septicemia. R. A. Kordenat, Chicago.—p. 132.
Brief Report of Annual Convention of Woman's Auxiliary of American Medical Association. Mrs. J. R. Neal, Springfield.—p. 139.

Relief of Projectile Vomiting in Infants by Irradiation of Upper Chest Region.—One hundred and twelve cases of vomiting in infants under 4 months of age have been studied by Barbour and Connell. In thirty-two cases the vomiting was found to be of definite toxic or infectious origin. The vomiting was relieved in thirty-seven cases by correcting the diet. Twelve cases were controlled with atropine and thick feedings. Eight patients were relieved by phenobarbital. Irradiation of the upper chest region resulted in relief in twenty-one cases. In two cases the Rammstedt operation was performed. In sixty-nine of these 112 cases the vomiting was not essentially projectile. In forty-three cases the vomiting was persistently true clinical projectile vomiting. These forty-three cases were treated with atropine, 20 per cent with phenobarbital, 45 per cent by irradiation of the upper chest, and 5 per cent by surgery. Seventeen cases are reported for the first time and four previously reported are included in the analysis. Of the twenty-one patients, five were relieved permanently by one exposure to the roentgen rays; three were relieved permanently by one exposure to radium; twelve were relieved temporarily by exposure to the roentgen rays, and then permanently by exposure to radium, and one patient who was exposed to the

roentgen rays without relief later was relieved temporarily by a Rammstedt operation, and three months later was permanently relieved of vomiting by exposure to radium.

Transfusion of Whole Blood in Treatment of Acute Hemolytic Streptococcic Septicemia.—The cases of hemolytic streptococcic septicemia reported by Kordenat did not show a favorable response to whole blood transfusion when such transfusions were used alone or in conjunction with other treatment directed to aid the body defenses or to destroy the streptococci directly in vivo. The mortality rate in instances in which long-chained hemolytic streptococci were revealed by blood culture was 100 per cent, while the mortality rate when short-chained streptococci were found in the blood was 60 per cent. Nevertheless, the author feels that transfusion of whole unmodified blood should be performed early in the course of the disease in conjunction with other measures directed to rendering the invading organisms less virulent and more susceptible to the phagocytic action of the freshly introduced leukocytes and the opsonic power of the plasma of the donor's blood.

Journal of Allergy, St. Louis

1: 105-208 (Jan.) 1930

*Allergy in Relation to Bee Sting. R. L. Benson and H. Semenov, Portland, Ore.—p. 105.
*Allergic Study of Entire Community: Etiology and Results of Treatment. G. Piness and H. Miller, Los Angeles.—p. 117.
Asthmatic State: 1. Stimulus. H. S. Baldwin, New York.—p. 124.
*Malarial Urticaria and Allergy. C. H. Eyermann and A. E. Strauss, St. Louis.—p. 130.
Fatal Bronchial Asthma: Two Cases. J. Harkavy, New York.—p. 136.
*Pyrethrum: Etiologic Factor in Vasomotor Rhinitis and Asthma. M. A. Ramirez, New York.—p. 149.
Constitutional Reactions Immediatley After Injection of Concentrated Serum. W. D. Sutliff and M. J. Kreamer, New York.—p. 156.
Botanic Survey of Memphis, Tenn., and Surrounding Territory. J. P. Henry and A. L. Herring, Memphis, Tenn.—p. 163.
*Allergic Purpura. F. L. Barthelme, Olney, Ill.—p. 170.

Allergy in Relation to Bee Sting.—An attempt was made by Benson and Semenov to evaluate the relative importance of the three factors concerned in the harmful effects of bee stings, namely, bee venom poison effects, pollen effects, and allergic reactions to proteins intrinsic in the body and stinger of the bee. The presence of venom and pollen action is admitted and recognized. They have, however, partially succeeded through testing and treatment in demonstrating that allergy to intrinsic bee proteins exists in certain individuals and that it is amenable to specific desensitization.

Allergic Study of Entire Community.—Piness and Miller studied all the inhabitants of two towns, one a mining community with a population of 3,000, the other an industrial community with a population of 1,500. In the former it was long thought to be the smelter fumes that produced in the inhabitants the symptoms leading to this study, and in the latter it was thought to be the potash dust. The suspicion arose that the symptoms were due to hay-fever rather than to chemical irritation. This report concerns the methods used in confirming this suspicion. After botanic surveys were completed, a census in the mining town showed 133 persons with hay-fever, a rate of 4.4 per cent. In the smaller community only fifteen patients presented themselves for study. Although only 133 patients lived in the mining community, 156 were studied, the additional patients coming from nearby territory. The statistics, therefore, concern 171 individuals. A history of positive heredity in parents was obtained in fifty-two cases, or about 30 per cent. The great majority of patients began to have hay-fever only after moving to these vicinities. The symptomatology was characteristic of hay-fever and 21.6 per cent of the patients also had asthma. Treatment was begun with 0.1 cc. of a 1 : 50,000 pollen extract administered hypodermically and then increased in ascending doses at five-day intervals, the final dose being 0.5 cc. of a 1 : 50 extract. The total dosage was then 33,330 pollen units given in twenty injections. It was occasionally necessary to administer treatment during the hay-fever season, in which circumstance the dosage was usually kept constant, about 0.3 cc. of a 1 : 5,000 solution. Because of the close control kept over both groups, the results of treatment were susceptible of being almost exactly evaluated. In the larger community reports on ninety-one patients were received. Of these five, or 5.5 per cent, showed failure of treatment; fifteen, or 16.5 per cent, obtained some relief and seventy-one, or 78 per cent, obtained good to complete relief. In the smaller community fifteen patients were treated and fourteen reports received. All fourteen results may be classed as practically complete to complete relief—in other words, a result approachng 100 per cent.

Malarial Urticaria and Allergy.—Eyermann and Strauss suggest that an urticaria occurring as the result of infestation with malarial parasites may be fairly held to be an allergic phenomenon.

Pyrethrum: Etiologic Factor in Vasomotor Rhinitis and Asthma.—In addition to the hazards encountered by industrial workers in the gathering of pyrethrum flowers and in their manufacture into insect powder, those resulting from the inhalation of fumes from popular insecticides are pointed out in the literature. Attention is directed by Ramirez to another source of danger inherent not only in the wild variety of pyrethrum, or chrysanthemum, but in the cultivation of the plant in gardens, by private citizens, or in hothouses by florists. As these contacts are presented at all seasons throughout the year, pyrethrum should be regarded as an etiologic factor in perennial rhinitis and asthma, and in certain types of dermatitis. For these reasons the necessity of testing with pyrethrum is emphasized.

Allergic Purpura.—Barthelme reports a case illustrating the association of Henoch's purpura and allergy. Skin tests for sensitization were made by the scratch method, and marked reactions to tomato, beef, wheat and egg yolk were obtained. The patient was advised to abstain from these foods, and within three days she felt markedly improved. All symptoms, excepting the purpuric areas which required time for absorption, had disappeared. About two weeks later, she ate a medium-sized dish of homemade ice cream, containing egg. Purpuric spots and some abdominal cramping were noticed the next day, and the patient was more careful about her diet thereafter. Deliberate feedings of the various foods to which she was sensitive gave the following results: beef and tomato: no symptoms produced; wheat: purpuric spots, muscle and joint pains, and lassitude; egg yolk: purpuric spots and abdominal pain. The patient, by abstaining from wheat and egg yolk, has remained entirely free from all symptoms for a period of approximately six weeks.

Journal of Comparative Neurology, Philadelphia

49: 1-222 (Dec. 15) 1929

Diencephalon of Carnivora: Nuclear Configuration of Thalamus, Epithalamus and Hypothalamus of Dog and Cat. D. M. Rioch, Ann Arbor, Mich.—p. 1.
Id.: Certain Nuclear Configurations and Fiber Connections of Subthalamus and Midbrain of Dog and Cat. D. M. Rioch, Ann Arbor, Mich.—p. 121.
Consideration of Certain Bulbar, Midbrain and Cerebellar Centers and Fiber Tracts in Birds. E. B. Sanders, Ann Arbor, Mich.—p. 155.

Kansas M. Soc. Journal, Topeka

31: 41-80 (Feb.) 1930

Electrocardiography in Clinical Study of Heart Disease. H. E. Marchbanks, Pittsburgh.—p. 41.
Diverticula of Colon. C. C. Nesselrode, Kansas City.—p. 62.
Interpretation of Blood Wassermann Reaction in Diagnosis of Latent and Late Syphilis. E. H. Terrill, Wichita.—p. 65.

Laryngoscope, St. Louis

40: 1-84 (Jan.) 1930

Surgical Anatomy of Maxillary Sinus. H. Neivert, New York.—p. 1.
Nonsurgical Consideration of Empyema of Maxillary Antrum. H. Smith, New York.—p. 5.
Intranasal Treatment of Suppurative Disease of Maxillary Sinus. C. J. Imperatori, New York.—p. 7.
Radical Operation of Antrum. E. R. Faulkner, New York.—p. 10.
Maxillary Sinusitis of Oral Origin. H. S. Dunning, New York.—p. 14.
Different Types of Deafness: Study of Etiology, Methods of Diagnosis, Prophylaxis and Treatment. J. E. Davis, Hartford, Conn.—p. 20.
Destruction of Lateral Sinus. L. R. Effler, Toledo, Ohio.—p. 39.
Congenital Laryngeal Stridor. F. T. Hill, Waterville, Me.—p. 44.
Relief of Nasal Obstruction in Children Without Subsequent Deformity. W. W. Carter, New York.—p. 55.
Diphtheria: Disease of Antiquity: Diphtheria and Tonsillectomy. F. W. White, New York.—p. 58.

Ludwig's Angina: Case. E. G. Gill and W. R. Whitman, Roanoke, Va. —p. 61.
Operative Hook-Up for Air Pump. J. B. H. Waring, Cincinnati.—p. 63.
Combined Instrument for Catheterizing Eustachian Tube and Sinuses. L. K. Pitman, New York.—p. 67.

New England J. of Medicine, Boston

202: 203-254 (Jan. 30) 1930

*New Methods for Clinical Study of Gallbladder. G. Levene and L. R. Whitaker, Norwood, Mass.—p. 203.
*Changing Causes of Death. G. H. Bigelow and A. Hamblen, Boston. —p. 215.
Undulant Fever. E. A. Lane, Boston.—p. 217.
Graham Test. E. L. Young, Jr., Boston.—p. 219.
Economic Value of Cod Liver Oil and Milk as Dietary Supplements for Underweight Adults. A. D. Holmes and M. G. Pigott, Stoneham, Mass, and W. A. Sawyer and L. Comstock, Rochester, N. Y.—p. 225.
Pelvic Abscess: Case. C. R. Alden, Boston.—p. 230.
Progress in Dermatology. H. P. Towle and J. L. Grund, Boston.—p. 231.

New Methods for Clinical Study of Gallbladder.—The determination of the presence or absence of gallbladder disease on the basis of information derived from the usual cholecystographic examination, Levene and Whitaker assert, is frequently not founded on adequate and conclusive evidence. Often it permits only of vague and general conclusions. Modifications are recommended and new methods and observations introduced which afford opportunity for more accurate and detailed description of the exact state of the gallbladder. Care and deliberation are essential, beginning with the preparations for administering the dye and attending every step to the final interpretation. The combined oral and intravenous administration, by producing greater density of the gallbladder shadow than the oral method alone, and by being singularly free from any of the reactions which may follow a full intravenous or a full oral dose, permits of accuracy without discomfort. Fluoroscopic examination is of great value as a supplement to the roentgenogram in a study of the resting gallbladder. It is of prime importance in studying the dynamics of the gallbladder. Since gallbladder contraction varies with the kind and amount of food eaten, it is essential to minimize this factor by establishing a definite motor meal. The authors add barium sulphate so that they may observe also the stomach and duodenum. During filling, the gallbladder is passive. Concentration is accomplished by physical and probably vital processes of the mucosa. Emptying takes places, on reception of the proper stimulus, only by activity of the muscularis. As seen under the fluoroscope, the activity of the muscularis combines intermittent wave motion and expulsive contractions with simultaneous tonic contractions. The latter show a remission to successively higher levels at the completion of each contraction cycle. Thus the gallbladder is reduced in size. No single roentgenographic finding is pathognomonic of any particular gallbladder disturbance except the demonstration of stones. Full proof of the absence of stones is obtained only by observing complete contraction and emptying of the gallbladder. The relative value of the roentgenographic and fluoroscopic observations is subject to variations occasioned by the consideration of each case.

Changing Causes of Death.—Bigelow and Hamblen have totaled the deaths in Massachusetts for the three year period from 1925 to 1927 and have indicated the order of the frequency of the first ten causes of death for all ages and in certain age groups. Then they have indicated where each disease occurred in order of frequency in 1915-1917 and 1905-1907, in order to note progress or regression. The following facts are noted as being favorable: the fall in the tuberculosis rate under 15 and over 40 years, making it now sixth instead of first among the total causes of death; the marked drop in diarrhea and enteritis in the first five years, placing it as tenth among the total causes, instead of fifth, as it was twenty years ago; the decrease in diabetes from 10 to 50 years; the complete obliteration of typhoid from a place in the first ten causes of death in any age group in 1925-1927. Unfavorable facts are: that prematurity, malformation and congenital debility have increased and now cause 47 per cent of all deaths under 1 year; the prominence of accidents from 1 to 50 years, and of suicides from 20 to 40 years; the increase in the prominence of measles and whooping cough in the age group 1 to 4; the inexcusable prominence of diphtheria from 5 to 14 years; the constantly increasing prominence of appendicitis over the twenty year period in all age groups from 5 to 50; that tuberculosis should be the principal cause of death from 15 to 40; the increasing prominence of cancer from 15 years on; the constant position of diabetes in the age group 50 to 59, and its increasing prominence thereafter; the absence of improvement in the total death rate over 50.

New York State J. of Medicine New York

30: 131-189 (Feb. 1) 1930

Sterility Diagnosis: Study of Sperm Cell Migration in Female Secretions and Interpretation of Findings. W. H. Cary, New York.—p. 131.
Medical Phase of Workmen's Compensation Law. J. S. Lawrence, Albany, N. Y.—p. 136.
Hypertrophic Pyloric Stenosis in Colored Infants. M. Gleich and S. Goodman, New York.—p. 140
Advantage of Complete Diagnosis in Cardiac Conditions R. H. Halsey, New York.—p. 141.
New Form of Birth and Death Certificates. J. V. DePorte, Albany.—p. 144.
Periodic Health Examinations from Standpoint of Otorhinolaryngologist. R. C. Howard, New York.—p. 146.

Ohio State M. Journal, Columbus

26: 97-192 (Feb. 1) 1930

Acute Ileus. E. J. McCormick, Toledo.—p. 117.
Various Types of Venous Thrombosis Including Pulmonary Infarction. L. C. Bean, Gallipolis.—p. 121.
Clinical Experience with Otitis Media and Mastoiditis in Infancy. W. B. Taggart and J. I. Hartman, Cleveland.—p. 126.
Unusual Sequelae of Intracapsular Extraction of Cataractous Lens. J. W. Millette, Dayton.—p. 130.
Value of Periodic Health Examinations in Detection of Early Tuberculosis. C. L. Hyde, East Akron.—p. 132.
Drug Addictions. C. C. Kirk, Orient.—p. 135.
Detection of Chronic Carriers of Typhoid Bacillus. G. W. Moorehouse, Cleveland.—p. 137.

Public Health Reports, Washington, D. C.

45: 169-224 (Jan. 24) 1930

Corrected Fatality Rates in Public Health Practice. H. W. Green and G. W. Moorehouse.—p. 169.

45: 225-271 (Jan. 31) 1930

Acute Response of Guinea-Pigs to Vapors of Some New Commercial Organic Compounds: 1. Ethylene Dichloride. R. R. Sayers, W. P. Yant, C. P. Waite and F. A. Patty.—p. 225.

South Carolina M. Assn. Journal, Greenville

26: 599-624 (Jan.) 1930

Congenital Malformation of Esophagus: Case with Tracheo-Esophageal Fistula. W. C. Marett and E. A. Hines, Jr., Seneca.—p. 601.
Newer Aspects of Infant Feeding. G. C. Brown and J. P. Price, Florence.—p. 604.
Management of Decompensating Heart. H. Smith, Greenville.—p. 610.
Peptic Ulcer Observation Based on Ninety-Three Cases. S. O. Black, Spartanburg.—p. 613.
Some Cures Relatively, Others Absolutely Original. G. P. Neel, Greenwood.—p. 616.

Virginia Medical Monthly, Richmond

56: 713-782 (Feb.) 1930

Cooperation Between Physician and Health Officer. C. R. Grandy, Norfolk.—p. 713.
Mooted Points in Diagnosis and Treatment of Diseases of Gallbladder. S. McGuire, Richmond.—p. 715.
Continuous Irrigation Therapy in Infected Wounds. L. D. Keyser, Roanoke.—p. 720.
*Food Allergy in Specialties and General Medicine. W. T. Vaughan, Richmond.—p. 725.
Talk to Country Doctors. J. B. Deaver, Philadelphia.—p. 731.
*Extradural Hemorrhage. J. G. Lyerly, Richmond.—p. 736.
Prenatal and Postpartum Care of Mother. J. M. Miller, Wytheville.—p. 745.
Management of Rachitic Child. T. R. Bowers, Bristol.—p. 748.
Vicious Circle in Veterans' Bureau. N. Mercer, Richmond.—p. 752.
Psychology: Relation to General Practice of Medicine as Viewed and Treated by General Practitioner. B. C. Keister, Harrisonburg.—p. 753.
Clinical Approach to Problem Child. H. D. Coghill, Richmond.—p. 756.
Neuropsychiatric Manifestations of Puberty. A. Gordon, Philadelphia. —p. 759.

Food Allergy in Specialties and General Medicine.—Vaughan shows how interrelated allergy may be with other disease processes. This possibility is to be considered especially in the presence of a positive past or family history of any of the more usual allergies. He emphasizes that negative observations after ordinary skin testing by no means rule out an actual existent allergy.

Extradural Hemorrhage.—Lyerly reports seventeen cases with four deaths. Sixteen of the patients were operated on, of whom three died.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British J. Bio.-Physics, London

2: 55-74 (Jan.) 1930

Diet, Medication and Ultraviolet Therapy in Acidosis. A. Furniss.—p. 57.
Polarization of Light and Relation Between Light and Electricity. H. J. Taylor.—p. 60.
Physical Therapy in Genito-Urinary Diseases. H. F. Wolf.—p. 65.
Quantitative Factors in Erythema Production. H. Goodman.—p. 68.

British Medical Journal, London

2: 135-180 (Jan. 25) 1930

Diagnosis and Treatment of Catarrhal and Ulcerative Colitis. H. L. Tidy.—p. 135.
*Use of Radium in Treatment of Rectal Carcinoma. J. P. Lockhart-Mummery.—p. 139.
*Ochsner-Sherren (Delayed) Treatment of Acute Appendicitis. H. Bailey. —p. 140.
*Use of Quinine in Normal Labor. D. A. Mitchell.—p. 144.
*Sodium Salicylate Liver Test. F. Marsh.—p. 146.
*Anesthesia for Short Operations on Children, Especially Tonsillectomy. H. M. Bird.—p. 147.
*Danish Treatment of Itch. A. Cannon.—p. 148.
Actinomycosis of Tonsils. V. Smith.—p. 148.
*Hereditary Lamellar Cataract. R. M. Galloway.—p. 149.
Suprapubic Hernia. E. Ward.—p. 149.

Use of Radium in Treatment of Rectal Carcinoma.—In view of the results to date, Lockhart-Mummery is of the opinion that no surgeon would advise the treatment of an operable case of cancer of the rectum by radium alone. The results of radium treatment at the present time do not justify its being used in place of excision in operable cases. In inoperable cases the results of radium treatment are good in some cases, and in some are unsatisfactory.

Ochsner-Sherren (Delayed) Treatment of Acute Appendicitis.—Bailey feels that the key to lowering the total mortality of appendicitis is to be found in the standardization of the type of case to be treated by immediate operation, together with the proper selection of patients for the Ochsner-Sherren treatment. Of 242 patients treated by operation within six hours of admission, including twenty-four with general or severe peritonitis, four died; of seventy-three treated by the Ochsner-Sherren method, one died.

Use of Quinine in Normal Labor.—Mitchell relates his experience with this method in more than 400 cases. The prescription he has used is as follows: quinine sulphate, 1½ grains (0.1 Gm.), dilute nitrohydrochloric acid, 3 minims (0.18 cc.), orange syrup, ½ drachm (1.8 cc.), and water, 2 drachms (7.5 cc.). This dose is given three times daily for three weeks prior to the expected date of labor.

Sodium Salicylate Liver Test.—Marsh tested the value of the peroral administration of sodium salicylate and its subsequent recovery from the urine in (1) cases of clinically definite liver disease; (2) normal men; (3) cases of clinically suspected liver disease. It is asserted by the authors of the test that sodium salicylate in doses of 0.04 Gm. can be swallowed by a healthy man and no trace of salicylic acid or sodium salicylate be detected in the urine afterward, owing to the destruction of the drug by the liver, but that in the case of a subject with liver disease quantities of unchanged salicylates would appear in the urine. The claims of the original authors were not borne out by the results attained.

Anesthesia for Short Operations on Children.—Bird relates his experiences with the closed ethyl chloride and oxygen narcosis method in more than 300 tonsillectomies. He comments on its safety and freedom from postanesthetic complications.

Danish Treatment of Itch.—Cannon discusses the Ehlers and Marcussen treatment first described in 1912: 1. One kilogram of sublimed sulphur is dissolved by heating it gently in 1 Kg. of a 50 per cent solution of potassium hydroxide, a clear yellow solution resulting. 2. Two hundred and twenty-five grams of petrolatum and 225 Gm. of wool fat are mixed with care, no heat being used. 3. To this mixture 375 Gm. of the solution of sulphur in potash lye is added. 4. Fresh zinc hydroxide is prepared by mixing 28 Gm. of zinc sulphate and 40 Gm. of a 20 per cent solution of sodium hydroxide. This is then added to the ointment. 5. Liquid petrolatum is added to make a total weight of 1,000 Gm. 6. Benzaldehyde, 5 Gm., is added to check the smell of hydrogen sulphide.

Hereditary Lamellar Cataract.—Galloway reports cases of hereditary lamellar cataract occurring through five generations.

2: 181-226 (Feb. 1) 1930

Use of Foxglove (Digitalis) at Bedside. K. F. Wenckebach.—p. 181.
*Cholecystitis and Gallstones. R. P. Rowlands.—p. 184.
Recent Advances in Diagnosis and Treatment of Diseases of Nervous System. C. Worster-Drought.—p. 186.
Physiologic Dilatation of Heart. C. Wilson.—p. 189.
Retention of Urine. H. J. McCurrich.—p. 192.
*Abortus Fever. J. N. Cruickshank and R. Cruickshank.—p. 195.
Some Diseases of Motorist. A. H. Douthwaite.—p. 195.

Cholecystitis and Gallstones.—Rowlands sums up his views in the following statement: Medical treatment having failed, operation for cholecystitis and gallstones should be carried out before the disease has spread beyond the gallbladder and cystic duct, so that the disease can be eradicated by cholecystectomy at a comparatively small risk. In later cases drainage of the gallbladder or common bile duct may have to be established in order to save life. These delayed operations have a much higher mortality, and are more often followed by recurrence of symptoms, often demanding secondary operation.

Abortus Fever.—The Cruickshanks report what they believe to be the first example of this disease to be recorded in Scotland. A diagnosis of abortus fever was made on the following grounds: (1) the presence of an undulant fever; (2) the presence of a high agglutinin titer (1 in 2,560) for *Brucella abortus*, and the absence of a positive Widal reaction for the typhoid-paratyphoid group; (3) the absence of clinical, bacteriologic and serologic evidence of any other infection likely to cause an undulant fever, and (4) the patient's close association with cattle. The absolute confirmation which isolation of the organism would have afforded is lacking, but the evidence seems sufficient to justify the diagnosis of abortus fever.

Journal of Physiology, London

68: 333-453 (Jan. 27) 1930

Double Heart-Lung-Kidney Preparation. A. J. Canny, E. B. Verney and F. R. Winton.—p. 333.
Standardization of Water-Soluble, Estrus-Producing Hormone. H. Allan, F. Dickens and E. C. Dodds.—p. 348.
Influence of Excision and Treatment with Saline on Pacemaker of Frog's Heart. J. J. Izquierdo.—p. 363.
*Effects of Emotion on Volume of Spleen. J. Barcroft.—p. 375.
Quantitative Observations on Thyroxin and Allied Substances: II. Effects on Oxygen Consumption of Rats. J. H. Gaddum.—p. 383.
Oxygen Consumption of Auricles of Frog and Tortoise. A. J. Clark and A. C. White.—p. 406.
Action of Ionic Changes on Oxygen Consumption of Frog's Auricle. A. J. Clark and A. C. White.—p. 433.
Effect of Variations in Diastolic Filling of Frog's Ventricle on Durations of Refractory Period and Mechanical Response. T. M. Tso.—p. 441.

Effects of Emotion on Volume of Spleen.—Barcroft found that by keeping a dog in a state of mental anxiety its spleen may be maintained in the partially contracted condition for at least half an hour. The known effect of epinephrine in producing contraction of the spleen has been confirmed in the exteriorized preparation, and a single injection of ephedrine has been shown to produce a contraction which passes off slowly, lasting over sixty and under 150 minutes. The smell, sound, sight or pursuance of a cat produces contraction of the spleen of a dog of suitable temperament. The degree of contraction is greater in the order of stimulus given.

Lancet, London

2: 169-222 (Jan. 25) 1930

Evolution of Surgery of Head Injuries. W. Trotter.—p. 169.
*Lactic Acid and Carcinoma of Stomach. E. C. Dodds and J. D. Robertson.—p. 171.
Human Machine: Efficiency and Limitations. A. Abrahams.—p. 174.
*Treatment of Lupus Erythematosus with Bismuth. R. M. B. MacKenna. —p. 178.
*Etiology of Yellow Fever. M. H. Kuczynski and B. Hohenadel.—p. 180.
Typhoid: Case. A. D. Gardner, F. G. Hobson and G. Stenhouse.—p. 182.
*Bronchiectasis: Forme Hémoptoïque Sèche. L. S. T. Burrell and R. R. Trail.—p. 182.
Use of Organic Sulphur Compound in Coccal Infections. E. Sassoon. —p. 183.

Lactic Acid and Carcinoma of Stomach.—Dodds and Robertson endeavored to determine the type of lactic acid pro-

duced in a series of cases of carcinoma, and thereby to trace its origin, in order to confirm or refute the statement that lactic acid can be produced rapidly in the stomach. The seven patients investigated included five with cases of proved carcinoma of the stomach and two in whom this condition was definitely excluded. The lactic acid in every case was of the inactive variety, which points strongly to a fermentative origin. Patients with obstruction had a much greater quantity of lactic acid than those without. When, however, there was no stenosis, the amount of lactic acid was often less than that found in some nonmalignant cases. It is felt that this is still further evidence in favor of the fermentative theory of the origin of lactic acid. The only remaining difficulty in the way of the fermentative theory is the claim by many workers that lactic acid is secreted rapidly even after washing out of the stomach. Evidence is brought forward that it is difficult to wash out the stomach of a patient with carcinoma properly, owing to the number of crevices and pockets around the growth. If, however, the technic described in the paper with two tubes is employed, it will be found that the amount of lactic acid in the latter specimens of the test meal is negligible, and the total acidity is low. These observations would indicate that the lactic acid is not secreted rapidly but appears in the test meal in appreciable quantities only if the washing has been insufficient and stagnant contents enter the main lumen from the various recesses and pockets around the growth. If the stomach of a patient with carcinoma is washed out on the night before the test meal, it is found that the resting juice collected twelve hours later contains practically no lactic acid. This is evidence that neither the stomach mucosa nor the growth is capable of producing lactic acid by itself even in twelve hours. It is interesting to note that there is no evidence of foulness in the resting juice of patients so treated. If the lactic acid content of the resting juice is contrasted with the clinical and radiologic evidence of obstruction, it is found that the lactic acid content is much greater in cases with obstruction than in cases without. It is felt that these observations prove that the lactic acid is produced through a fermentative action combined with pyloric obstruction, and is, therefore, of little or no diagnostic value for carcinoma of the stomach. In support of this it is found that the lactic acid content in cases of carcinoma with no obstruction is often less than that found in nonmalignant diseases.

Treatment of Lupus Erythematosus with Bismuth.—MacKenna has treated twenty-four cases of chronic lupus erythematosus with bismuth injections. Metallic bismuth, bismuth oxychloride, and sodium bismuth thioglycollate have been used, deep injections being given subcutaneously or intramuscularly. Whenever possible the injections have been given once weekly or fortnightly, and in the majority of the cases after every ten or twelve injections a period of some six weeks has been allowed to elapse before bismuth treatment is continued, so that there would be no risk of poisoning due to a cumulative effect. In the majority of the cases, 0.4 Gm. of the metal or its salt has been given at each injection. MacKenna has found that metallic bismuth and bismuth oxychloride have approximately an equal therapeutic effect, while the thioglycollate, which is a water-soluble bismuth salt, and therefore enables one to obtain a higher concentration of bismuth for a short period, has not given better results than the other preparations. He has tentatively tried giving bismuth oxycarbonate and bismuth salicylate in doses of from 5 to 10 grains (0.32 to 0.65 Gm.) thrice daily by mouth, but without any apparent advantage to the patients. Every patient so treated has improved, and has improved more rapidly than would have been anticipated had other remedies been employed. One other satisfactory finding is that the lesions which respond to bismuth treatment heal with a minimum of scar formation, and in several cases; notably those belonging to type 2, healing has taken place without any residual scar being formed. It is suggested that local application of acid nitrate of mercury, in conjunction with bismuth therapy, is the most satisfactory line of treatment and that the therapeutic action of bismuth is to inhibit the reaction of the lesions to the toxins (or bacteria) which cause the disease, and that therefore cases which have been apparently cured will probably show a relapse.

Etiology of Yellow Fever.—Kuczynski and Hohenadel report further on their study of the cause of yellow fever and on experimental work on monkeys with *Bacillus hepatodystrophicans.*

Bronchiectasis: Forme Hémoptoïque Sèche.—This form of bronchiectasis discussed by Burrell and Trail is characterized by periodic attacks of hemoptysis but absence of symptoms between the attacks.

South Africa M. Assn. Journal, Cape Town

3: 693-724 (Dec. 28) 1929

Importance of First Cases. W. P. Le Feuvre.—p. 695.
Significance of Urinary Obstruction as Exemplified by Congenital Anomalies of Kidney and Ureter. L. B. Goldschmidt.—p. 699.
Intestinal Flagellosis (Trichomonas Hominis): Case. H. D. Ackermann.—p. 703.
Pitfalls in Prognosis of Heart Disease. A. E. Thomas.—p. 705.
*Blackwater Fever. J. Harper.—p. 707.
Exophthalmos and Mixed Astigmatism Caused by Large Ethmoid Mucocele. E. A. Seale.—p. 709.
*Hernia: Case. I. Z. G. Nel.—p. 710.

Blackwater Fever.—Harper asserts that the curative administration of quinine when properly carried out is an effective treatment, but that few people understand the proper doses and the length of treatment. He regards blackwater fever as a toxemia of malaria, believing that this toxin is produced by the death of the malarial parasite, and when an excess of toxin is produced greater than what can be got rid of through the ordinary channels of elimination, blackwater fever supervenes. In all cases of blackwater in the early stages quinine should not be administered. Except under the most favorable conditions, the patient should not be moved. Patients with blackwater fever cannot stand long traveling. Later on, when the urine has cleared and the vomiting is checked, the danger is not so great. A brisk purge should be administered at once, and the rectum thoroughly washed out. Then 1 pint of physiologic solution of sodium chloride should be administered by rectum, and this repeated every four hours until the urine has cleared. Hot packs should be applied over the kidneys. The patient should be nursed between blankets. Barley water and milk can be freely administered, and, if available, a little iced champagne. For continuous vomiting a mustard plaster over the stomach is helpful. In suppression of urine the author has had excellent results from the administration of methenamine, which appears to counteract the effects of the toxin in the kidneys.

Hernia.—Nel relates the case of a girl who complained of acute attacks of abdominal pain, lasting for about ten minutes at a time, and aggravated by food of any description. She had vomited, and there was a slight amount of hyperacidity. On examination there was nothing more than a slight rigidity over both rectus muscles above the umbilicus. A tentative diagnosis of gastric ulcer was made, and the patient was put to bed on a liquid diet and alkaline treatment. Twenty-four hours afterward she went into an extreme state of collapse, suffering from acute abdominal pain. She had vomited, and the abdomen was like a board. All this led to a diagnosis of a perforation. When the abdomen was opened free fluid, slightly bloodstained, welled up, and a reddish distended mass presented itself in the wound. On examination this was found to be a strangulated loop of the jejunum, dragging with it a portion of the pancreas through an opening in the transverse mesocolon. The hernial protrusion was easily reduced, and the rent in the transverse mesocolon closed with catgut. The patient made an uneventful recovery. Later it was learned that about ten days before her illness she had been thrown heavily from a horse, landing, as she said, flat on the abdomen. She had had only a little pain then.

Bull. et Mém. de la Soc. Méd. des Hôpitaux de Paris

53: 1475-1563 (Dec. 30) 1929

Antityphoid Vaccine in Treatment of Anaphylactic Disease. M. Renaud.—p. 1476.
*Cavitary Form of Primary Cancer of Left Lung. F. Bezançon, Azoulay and Duruy.—p. 1478.
Cyst of Base of Pericardium. H. Dufour and Mourrut.—p. 1482.
Cirrhosis of Cruveilhier-Baumgarten: Case. P. Pagniez and R. Rivoire.—p. 1482.
*Acute Encephalomyelitis with Neuralgia and Symptoms of Meningitis. L. Babonneix and J. Sigwald.—p. 1486.

"Dyschrondrosteosis": Case. A. Léri and J. Weill.—p. 1491.
Intermittent Tetanus. P. Pagniez and R. Rivoire.—p. 1494.
Hodgkin's Disease: Paraplegia with Meningeal Involvement. Cain, Rachet and Horowitz.—p. 1498.
Malignant Endocarditis. M. Renaud and A. Miget.—p. 1508.
Acute Nephritis Due to Mercuric Oxycyanide. E. Bernard, Laudat and Maisler.—p. 1511.

Cavitary Form of Primary Cancer of Left Lung.—Bezançon et al. describe the clinical history of a man, aged 51, in whom a syndrome of suppuration of the left apex and a fetid breath were noted. Roentgen examination showed an air-water cavity with a double contour. Necropsy revealed cancer, coincident with the formation of an abscess.

Acute Encephalomyelitis with Neuralgia and Symptoms of Meningitis.—Babonneix and Sigwald's patient, aged 32, had been suffering from meningeal symptoms for nine months, which were accompanied by severe recurrent infra-occipital neuralgia and photophobia. There was no syphilis. Treatment by pyretotherapy for two weeks was successful. The authors discuss the symptomatology and hold the occurrence of acute encephalomyelitis with peripheral manifestations responsible for the condition.

Bulletins et Mém. de la Soc. Nat. de Chirurgie, Paris

55: 1173-1207 (Nov. 23) 1929

Mikulicz Drainage in Pylorectomies. G. Métivet.—p. 1174.
*Spontaneous Opening of Pelvic Abscess into Intestine. M. Vanlande. —p. 1175.
Chronic Biliary Fistula: Spontaneous Fracture of Left Transverse Process of First Lumbar Vertebra. Leclerc.—p. 1181.
Abdominal Hemorrhage from Ruptured Menstrual Corpus Luteum. J. Murard.—p. 1184.
Intestinal Obstruction Caused by Biliary Calculi: Three Cases. Morice. —p. 1187.
Biliary Calculus Causing Intestinal Obstruction: Case. P. Brocq, P. Brodin and Aimé.—p. 1194.
Orchiepididymitis of New-Born Infants. P. Lombard.—p. 1200.
Splenomegaly with Severe Hematemesis. P. Duval.—p. 1203.

Spontaneous Opening of Pelvic Abscess into Intestine.—Vanlande's patient, aged 35, had been injured fifteen years previously by a blow in the sacral region. A voluminous hematoma resulted and two years later an abscess formed which was drained. The abscess recurred eight months later, but it opened spontaneously and healed rapidly. During the patient's stay in Central Africa ten years later a chronic suppuration in the right buttock with severe neuralgic pain of the sciatic nerve developed. It was not until seven months later that he could be examined. There was no involvement of the bone and the abscess was treated by incision and drainage. The pain was relieved but the wound healed slowly. Several months later a new abscess formed and during treatment Vanlande noted the passage of air from the fistula. Shortly afterward a rectal hemorrhage occurred. Through the injection of a coloring substance into the fistula, the existence of an intestinal perforation was confirmed. Roentgen examination revealed the presence of a short filiform stricture of the pelvic colon. The condition of the patient became worse and operation was performed in two stages. In the first, an artificial cecal anus was formed and partial deviation of the intestinal contents was obtained. Five weeks later a second artificial anus at the perforation was made and a Mikulicz tampon was placed in the pelvis. This artificial anus on the left side was closed three weeks later. Two months after the intervention a simple stercoral fistula persisted. Closure of the cecal anus was delayed for several months because of minor inflammatory processes. However, the natural anus was permitted to resume its function and in spite of persisting symptoms of minor local infection the general condition now is satisfactory. There is no pain and the patient has resumed his occupation.

Journal d'Urologie Médicale et Chirurgicale, Paris

28: 425-536 (Nov.) 1929

Benign Tumors of Female Urethra. G. Nora.—p. 425.
*Calculi of Urinary Tract: Observations in Two Hundred and Forty-Four Patients. J. G. Gottlieb.—p. 433.
*Streptococcus in Cystitis. V. d'Alesio.—p. 449.
*Recurrence of Calculi of Urinary Bladder. L. Strominger.—p. 460.
Immunity Toward Gonococcic Infection. M. Saigrajeff.—p. 465.

Calculi of Urinary Tract: Observations in Two Hundred and Forty-Four Patients.—Gottlieb reports that of 605 patients with diseases of the urinary tract who came under his observation within the past six years, in 244 calculi formation in the kidneys or ureters was noted. A progressive increase in the absolute number of such patients was observed as well as an increased incidence of those having ureteral calculi. The author discusses the literature and the methods for diagnosis and favors the technic of pyelography, which should be applied not only with typical symptoms but also if unusual clinical manifestations arise. Only two thirds of his patients had pain; hematuria was noted in 65.2 per cent of all patients. In 7 per cent (seventeen patients) previous expulsion of calculi had occurred. According to Gottlieb, four fundamental types of unilateral formation of renal calculi may be seen which it is important to recognize as guides indicating surgical intervention. In spite of a low mortality rate, Gottlieb believes that operations are, on the whole, too often performed, as the calculi frequently recur. The results of his experience in patients with ureteral and bilateral calculi will be reported at a later date.

Streptococcus in Cystitis.—On the basis of his personal experience with twenty-five cases of cystitis and pyelocystitis and a review of the literature, d'Alesio discusses the results of bacteriologic examination. He was able to isolate streptococci in nineteen patients—thus in 76 per cent of all cases as compared to about 6 per cent reported in the literature. The use of culture mediums containing proteins which should not be overheated is responsible for this result. The author states that he was able to differentiate between hemolytic and anhemolytic types of streptococci, both of which were slightly toxic for rabbits.

Recurrence of Calculi of Urinary Bladder.—Strominger relates the clinical history of a man, aged 61, who had been suffering from the condition for more than eighteen years. In spite of two cystostomies and prostatectomy, the formation of calculi was not inhibited and his condition could be relieved only by frequent lithotrities. According to the author a definite therapy cannot be advised, as the formation of calculi is probably due to disorders of metabolism and is dependent on internal secretion.

Paris Médical

1: 1-32 (Jan. 4) 1930

Tuberculosis During 1930. P. Lereboullet and M. Lelong.—p. 1.
Tubercle Bacilli Without Caseous Lesions in Experimental Tuberculosis of Guinea-Pigs. L. Bernard, Desbuquois and Thoyer.—p. 10.
*Secondary Infection of Lung with Tuberculous Infiltration of Cervical and Mediastinal Lymph Nodes. E. Sergent.—p. 14.
Present Status of Problem of Surgical Treatment of Pulmonary Tuberculosis. A. Maurer and J. Rolland.—p. 19.
Dietary Treatment of Pulmonary Tuberculosis. E. Vaucher and E. Grunwald.—p. 25.
*Effect of Liver Extract on Anemia in Persons with Pulmonary Tuberculosis. C. Garin, J. Boucomont and Rougier.—p. 31.

Secondary Tuberculous Infection of Lung.—Sergent relates the clinical history of a woman, aged 23. Her mother had succumbed to pulmonary tuberculosis at the age of 20. The patient herself, however, had a negative pulmonary history. Three months previously she had had an abortion and had been feeling poorly since then. In addition she revealed that she had been dieting to reduce in weight. Enlarged, slightly painful, supraclavicular lymph nodes were noted on clinical examination. They were not visible on roentgen examination nor did the lungs appear to be abnormal. Examination of the tonsils revealed marked degeneration. Within the next two weeks increasing involvement of the lymph nodes was noted coincident with a marked tachycardia. The next two months were without incident except for a gradual development of asthenia and loss of weight. However, the disease rapidly progressed from then on. The temperature was irregular, profuse sweating and tachycardia were noted, phlebitis developed in the right leg and the lungs showed progressive involvement. As there was no expectoration the stool was examined microscopically and found to contain tubercle bacilli. Death ensued from asphyxiation several weeks later. Sergent discusses the literature and concludes that the infection was a secondary one with the tonsils as the portal of entry.

Effect of Liver Extract on Anemia in Persons with Pulmonary Tuberculosis.—Garin et al. report the results of this dietary treatment in sixteen patients who had been inmates of an institution for one month previous to the experiment and had become adjusted to the conditions of living. Although neither the weight nor the pulmonary condition was modified after two weeks of treatment, examination of the blood showed a considerable increase of erythrocytes. The hemoglobin content was likewise increased, although not in every case proportional to the erythrocyte count. The leukocytes were not modified. The authors favor ingestion of liver extract in view of the favorable results obtained in 80 per cent of their patients.

Presse Médicale, Paris

38: 1-16 (Jan. 1) 1930

*Interposition of Colon Between Liver and Diaphragm. F. Trémolières and E. J. M. Pierron.—p. 1.
*Hypostatic Supramalleolar Cyanosis. G. Delater.—p. 3.

Interposition of Colon Between Liver and Diaphragm.—Trémolières and Pierron present two observations of this rare occurrence. In one patient clinical examination had already led to the diagnosis; roentgen examination in both instances showed the interposition. Both patients had ulcers and in one patient an enlarged colon was observed. Chronic appendicitis and pleurisy may in addition have been responsible for the formation of adhesions which caused a union of the liver to the intestine. Persistence of the pleurisy led to a change of thoracic pressure favoring the condition. Removal of the ulcers and adhesions, gastro-enterostomy and appendectomy were done and both patients recovered.

Hypostatic Supramalleolar Cyanosis.—Delater discusses the symptoms of this disease. As erythrosis and cyanosis have an opposing action, he does not favor the terminology of erythrocyanosis or erythema of the legs, which along with a number of other names have been in use. The author recalls his previous paper on the subject and points to the classification of local cyanosis, which he briefly summarizes.

38: 17-32 (Jan. 4) 1930

*Polyglobulism: Roentgen Therapy. P. Pagniez, L. Rouquès, I. Solomon and F. Bardin.—p. 17.
*Chronic Appendicular Cholecystitis. J. Dalsace.—p. 18.
Seasickness: Treatment with Alkaloids of Belladonna and Phenobarbital Preparations. J. Bohec.—p. 21.

Polyglobulism: Roentgen Therapy.—From a discussion of the results of this treatment in four cases and a review of the literature, Pagniez et al. consider the effects of roentgen irradiation as a possible guide in the classification of secondary polyglobulism.

Chronic Appendicular Cholecystitis.—From a consideration of the clinical histories of sixty patients and a review of the literature, Dalsace concludes that this condition may be considered as possessing a well defined syndrome. Accordingly three characteristic types may be recognized; namely, patients with appendicitis and a slight involvement of the gallbladder which reacts favorably to treatment by medication, those in whom appendicitis is noted coincident with a condition of the gallbladder necessitating surgical intervention, and a group of subjects having symptoms of cholecystitis with or without perivisceritis or epiploitis. With exclusion of those patients in whom immediate operation is necessary, the treatment may be carried out in three stages. A period of conservative medication is followed by surgical intervention to remove the appendix or the gallbladder and associated lesions. The author especially stresses the importance of postoperative therapy for complete recovery or at least considerable improvement such as he obtained in his patients.

Revue de Chirurgie, Paris

67: 455-514, 1929

*Congenital Malformations of Ileocecal Valve. P. Bohême and M. Rivalland.—p. 455.
*Strangulated and Gangrenous Hernias: Surgical Treatment. H. Godard and C. Palios.—p. 476.
Temporary Disarticulation (Method of Delbet) in Diseases of Instep. E. Mériel.—p. 502.

Congenital Malformations of Ileocecal Valve.—On the basis of their experience in one case and a study of five additional cases reported in the literature, Bohême and Rivalland discuss the etiology and clinical symptoms of this rare occurrence. In their patient, a boy aged 2½ years, digestive disorders had been noted since the age of 3 weeks. Severe intestinal colics and vomiting with gradual loss of strength had persisted for about three weeks previous to his admission. A diagnosis of intestinal obstruction was made and operation performed. The loops of the small intestine were distended and hypertrophied coincident with a condition of chronic inflammation especially noticeable around the ileocecal valve. The intestine was sclerotic and retracted and the ascending portion of the colon was markedly atrophied. Removal of the appendix, which was adherent, although it appeared otherwise normal, did not relieve the stricture. In view of the feeble condition of the patient and the impossibility of reducing the obstruction, gastrostomy with fixation of the intestinal loop in the immediate vicinity was done. The operation was performed too late to save the child, and death ensued with symptoms of intoxication two days later. The authors recognize the difficulty of diagnosis and point to the importance of early intervention. The operation is, however, difficult in children and the prognosis on the whole unfavorable.

Strangulated and Gangrenous Hernias: Surgical Treatment.—Godard and Palios report the results obtained in 122 cases within the last five years in eighteen of which resection, followed by immediate suture, was performed. Of fifty-four patients, with a gangrenous femoral hernia, thirty-six were women and eighteen men. In thirty-three patients the site was on the left side and in nine on the right; in the remainder it had not been defined. In thirty-six patients with simple hernia, only one death was reported. Of three in whom resection with restoration of the anus had been made, two died. In thirteen patients the hernia was resected and immediate suture made. Five deaths were reported. In fifty-three patients inguinal hernias had occurred; forty-four of these were men. The site was on the right side in twenty-six cases, on the left in nineteen and not defined in nine. In only three patients was resection with immediate suture done, and recovery ensued each time. Fifteen cases of strangulated umbilical hernia were reported. The prognosis was unfavorable and four deaths ensued in simple hernias. However, the outcome was fatal in two patients in whom resection with suture had been made. In all these patients resection of the small intestine had become necessary in twenty instances and of the colon in one; in two others partial burying was done. In 104 patients recovery had ensued as compared to eighteen deaths; the mortality was therefore 14.8 per cent. The prognosis in all strangulated hernias depends on the degree of the toxemia. Thus in strangulated umbilical hernias with extensive intestinal stasis, the mortality was 36.3 per cent, whereas in strangulated inguinal and femoral hernias a mortality of from 2 to 4 per cent was noted. The authors point out that although local anesthesia does not give favorable results, the importance of the type of anesthesia has been overestimated. Increasing the favorable results of postoperative treatment by antitoxic vaccines may further help to reduce the mortality of 38.8 per cent reported by the authors with the technic of resection with suture.

Revue d'Orthopédie, etc., Paris

16: 481-704 (Nov.) 1929

Calcareous Deposits in Periarthritis of Shoulder Joint. E. Stulz and E. Brenkmann.—p. 481.
*Ostearthritis as Complication of Smallpox. P. Lombard.—p. 490.
Divergent Dislocation of Elbow. P. Ingelrans.—p. 497.
*Pseudarthrosis of Forearm: Periarterial Sympathectomy. A. Floresco.—p. 503.
Anomalies of Patella (Patella Bipartita) and Unrecognized Fracture of Patella. Botreau-Roussel and A. Mouchet.—p. 511.
Juxtarticular Osteitis. M. Andrieu.—p. 522.
Recurrent Luxations of Shoulder. L. Tavernier.—p. 575.
Osteosynthesis Without Foreign Body. A. L. Soresi.—p. 622.
Primary Bone Infection of Mycotic Origin. M. Meyer.—p. 624.
Arthrodesis of Hip Joint for Coxalgia. Delahaye.—p. 632.
Fractional Osteotomy of Tibia for Rachitic Curvature of Legs. L. Michel.—p. 634.

Ostearthritis as Complication of Smallpox.—Lombard reports this rare occurrence in a boy, aged 7, who had had smallpox three years previously. Multiple painful tumefac-

tions had occurred and several abscesses finally localized in the elbow joints, causing complete ankylosis. The second observation was in a boy, aged 13, in whom multiple lesions of the bones had developed since he had had smallpox at the age of 2. In both cases a marked affinity of the epiphysis, and especially of the radius, was noted to the streptococcic infection which had incited the osteomyelitis.

Pseudarthrosis of Forearm: Periarterial Sympathectomy.—In Floresco's patient, aged 46, a fracture of the right forearm had remained obdurate to treatment by immobilization. In spite of osteosynthesis with renewed immobilization for three months, consolidation did not take place. Within several minutes after the sympathectomy the arm, which had been fixed at a right angle reacting with pain to all attempts at extension, was spontaneously released. The arm was again immobilized for forty days and it was subsequently noted that the fracture had become consolidated with restoration of normal function.

Schweizerische medizinische Wochenschrift, Basel

60: 1-24 (Jan. 4) 1930

Critical Remarks to Discussions on Various Aspects of Pulmonary Tuberculosis. H. Sahli.—p. 1.
Various Forms of Hemiplegia: Their Treatment. O. Veraguth.—p. 9.
Newer Results of Roentgenoscopy: Distant and Total Roentgenography. D. Mulder.—p. 14.
*Treatment of Hemophilia. P. Niehans.—p. 18.
Posterior Dislocation of Humerus. G. Peillon.—p. 19.

Treatment of Hemophilia.—The fact that a woman transmits hemophilia without herself being subject to it convinced Niehans that the female organism contains an antidotal substance against this condition. He reasoned that the implantation of an ovary into a hemophilic person would, perhaps, influence the coagulation of the blood. He implanted the ovary of a calf, without a corpus luteum, into the oblique abdominal muscles of a hemophilic patient, aged 25. After six and one-half months the ovary was no longer palpable and the coagulation time had been reduced from five hours to two and one-half hours. The author likewise performed an implantation on the brother of the patient, aged 10. In this instance the ovary of a sheep with a corpus luteum was used. After six and one-half months the implant was still palpable and the coagulation time was not changed. The fact that the implantation of the ovary without a corpus luteum reduced the coagulation period, whereas by the implantation of the ovary with a corpus luteum the coagulation time was not influenced, indicates that the hormone that accelerates coagulation is secreted by the ovary only at certain times. Later the author implanted into the same patients pieces of two ovaries removed from a woman immediately after menstruation. Into the one a piece of tissue from the ovary without a corpus luteum was inserted, whereas into the other patient a piece of tissue from the ovary with a corpus luteum was implanted. The results were similar to those in the first experiment. The implant from the ovary without a corpus luteum reduced the coagulation time to one and one-half hours, whereas in the other patient the coagulation time was unchanged. In view of the fact that these observations were made in only two patients, the author does not draw general conclusions. However, he recommends the further investigation of the problem.

Folia Gynaecologica, Pavia

27: 1-195, 1930

*Glycemic Reaction to Epinephrine in Pregnancy. D. Rossi.—p. 1.
*Irradiation of Hypophysis in Relation to Motor Functioning of Uterine Tube. A. Martinolli.—p. 13.
Observations on Uterine Chorio-Epitheliomas of Interstitial Origin. M. Massazza.—p. 25.
Syphilitic Manifestations of the Portio Vaginalis of the Uterus. B. Buzzi.—p. 65.
Deep Chorial Infiltration in Myometrium. L. Roffo.—p. 89.
Arterial Circulation of Uterus and Adnexa: Roentgen Study. G. B. Contardo.—p. 117.
Partial Hysterectomy of the Fundus. M. Massazza.—p. 157.

Glycemic Reaction to Epinephrine in Pregnancy.—Rossi, in a series of animals, found a glycemic reaction to epinephrine during pregnancy and also in the absence of pregnancy and reached the conclusion that during gestation all the types of epinephrine hyperglycemias may be found but that there is no special glycemic reaction characteristic of pregnancy. The reaction, too, varies greatly in the same animal, depending on the time the test is made.

Irradiation of the Hypophysis in Relation to the Motor Functioning of the Uterine Tube.—Martinolli recalls the important functional relations existing between the hypophysis and the genitalia and also the knowledge that we possess with regard to the influence that irradiation of the hypophysis exerts on the female genitalia. He describes a series of researches during which he studied the motor functioning of the uterine tubes in animals subjected to irradiation of the hypophysis. In animals thus irradiated he noted a marked disturbance of the functioning of the tube with marked diminution and sometimes complete absence of motility. The author advances certain hypotheses in explanation of this observation, and considers the relations that might exist between the changes in the motor functioning of the tube and the various pathogenic factors of extra-uterine pregnancy.

Pediatria, Naples

38: 1-64 (Jan. 1) 1930

Prognosis and Treatment of Cephalocele: Three Cases. G. Jemma.—p. 1.
Plantar Reflex on Extension of Leg in Physiologic Conditions. G. Salvioli.—p. 25.
*Neutralization in Vitro of Diphtheria Toxin by Suprarenal Hormone. F. Graziano.—p. 33.
*Is Recurrence of Scarlet Fever Rare? P. Iacchia.—p. 41.

Neutralization in Vitro of Diphtheria Toxin by Suprarenal Hormone.—Graziano reviewed the literature and made experiments to determine the neutralizing effect of suprarenal hormone on diphtheria toxin. The minimum lethal dose of diphtheria toxin, of epinephrine and of suprarenal extract was determined. The author used mixtures of toxin and epinephrine (the last mentioned at 1 per thousand), of toxin and suprarenal extract, a.[1] of toxin and 1 per cent emulsion of cholesterol. The injection of these mixtures was given either subcutaneously or intracardially. All animals died at different periods, from immediately after the injection to twelve days later. The animals inoculated with a mixture of toxin and epinephrine presented at the point of the inoculation a fibrinous exudate instead of the gelatinous exudate that appears when only diphtheria toxin is injected, while the animals inoculated with mixtures of toxin and suprarenal extract, as well as those inoculated with a mixture of toxin and an emulsion of cholesterol, presented at the same point an area of cutaneous necrosis. On the basis of the results of his experiments, the author concludes that suprarenal extract, epinephrine and cholesterol do not neutralize diphtheria toxin in vitro. The mixtures of toxin and epinephrine, toxin and suprarenal extract, and toxin and cholesterol caused a decreased hyperemia of the internal viscera. The author does not believe that epinephrine has a favorable influence on the evolution of diphtheria in human beings.

Is Recurrence of Scarlet Fever Rare?—Iacchia reports the case of a family in which the mother developed a scarlatinal angina reinfection while attending her eldest son, aged 7, who had scarlet fever. She had had typical scarlet fever when she was a child. The boy in turn had a grave recurrence two years later, contracting the disease from his younger brother. The author says that scarlet fever does not confer lasting immunity, and for this reason the isolation of patients should be compulsory, even if other members of the family have had the disease, in order to avoid possible recurrences (which may bring worse complications than the first attack), and also to prevent members of the family from carrying the germs to other people.

Riforma Medica, Naples

45: 1545-1576 (Nov. 16) 1929

*Is There a Primary Amebic Cholecystitis? M. Sfameni.—p. 1547.
*Action of Viosterol on the Reparation of Fractures. G. Roi.—p. 1551.
Therapeutic Value of Synergized Morphine. U. Baccarani.—p. 1553.

Primary Amebic Cholecystitis?—Sfameni brings out that, contrary to the conception of certain authors, especially the French, the Italian school does not admit a primary cholecystic

lesion due to *Endameba*, as it does not admit a cholecystic lesion due to *Endameba* independent of an hepatic lesion. The Italian school holds that two types must be distinguished: (1) a pseudocholecystic syndrome of amebic hepatitis, which may be observed not only in acute or subacute noncolliquative hepatitis but also in colliquative hepatitis, and (2) a cholecystic syndrome, always following hepatitis. The treatment of these two types is in nowise different from the well known treatment of amebic hepatitis.

Action of Viosterol on the Repair of Fractures.—Roi states that thus far few researches on this subject have been reported and that the conclusions of the investigators do not agree. Bors thought that viosterol accelerated the reparation of fractures. Hellner, who carried out researches on rats and guinea-pigs, found no difference between the animals treated with viosterol and the controls, on the basis of roentgen histologic and chemical examinations. Lopez reached the same conclusions as Hellner. Roi's researches were carried out on guinea-pigs. They were subjected to the administration of a 1 per cent oily solution of viosterol, given on alternate days by the parenteral route in doses of 0.5 cc. (equal to 5 mg. of ergosterol). His observations of results agree with those of Bors and are opposed to those of Lopez, Hellner and Chiariello. He found the process of consolidation of the callus to be more rapid than in the controls.

45: 1577-1612 (Nov. 23) 1929

Endoscopic Study on Bladder Evacuation. L. Caporale.—p. 1579.
*Biologic Diagnosis of Echinococcus Cysts in Man. F. Cantani.—p. 1586.
*Dropsy of the Gallbladder: Case. C. Gianturco.—p. 1592.
Metallism in Hydropneumothorax. G. Cicconardi.—p. 1594.

Biologic Diagnosis of Echinococcus Cysts in Man.—Cantani draws these conclusions from his researches: 1. In the biologic diagnosis of the echinococcus cyst, researches on eosinophilia, owing to its inconstancy and marked lack of specificity, have no importance. 2. The Ghedini-Weinberg test, executed with the described technic, has been found to be of unquestionable value, giving a low percentage of error. The false negative reactions must be attributed to the insufficient sensitiveness of the antigen used rather than to a state of anergy or of antianaphylaxis of the organism. 3. The antigen consisting of the human cystic fluid, without the addition of disinfecting substances and without special treatments, was found frankly superior in sensitiveness and specificity to the cystic fluid of sheep. 4. Alcoholic and ethereal extracts of membranes of human cysts were found to possess little or no antigenic capacity.

Dropsy of Gallbladder.—Gianturco brings out that whereas, up to a few years ago, it was generally held that an occlusion of the bladder sufficed to produce dropsy, the present trend of opinion is that, in addition to the closure of the excretory duct, the anatomic abolition of the mucosa, or at least an alteration in its functioning, is necessary and that that is usually brought about by infective processes developing within the bladder. In the reported case, the existence of an infective factor is shown by the frequent elevations of temperature to which the patient was subject when she suffered her attacks of pain. In addition, the operative finding of a mucosa of gelatinous aspect and so friable as to be easily pierced with the dull edge of the spoon with which the calculi were removed furnished the author further evidence that the mucosa was no longer functionally normal.

Semana Médica, Buenos Aires

36: 1533-1608 (Nov. 28) 1929. Partial Index

Social Work in Hospitals: Dispensaries for Needy Persons. A. Zwanck and S. I. Bettinotti.—p. 1533.
*Recurrence of Tubal Pregnancy in Stump of Excised Tube After Three Years. A. Bello, V. Widakowich and A. Falsia.—p. 1536.
Thrombocytopenic Hemorrhagic Purpura: Splenectomy. A. Ceballos and H. Taubenschlag.—p. 1542.
*Medicosocial Protection of Mothers in Russia. M. L. Pérez.—p. 1557.
Importance of Biopsy in Early Diagnosis of Cancer. J. C. Berri.—p. 1561.
Diagnosis and Treatment of Chronic Cholecystitis and Strawberry Gallbladder. C. Velasco Suárez.—p. 1563.
*Cerebrospinal Meningitis: Early Diagnosis. S. Miyara and G. Basso.—p. 1570.
*Phrenicectomy in Hemoptysis of Tuberculous Patients. F. Bertotto and R. Dal Lago.—p. 1579.
Treatment of Wounds Caused by Nails or by Pointed Objects. R. Faggioli.—p. 1590.
Hygiene of Mouth: Dental Atomizations in Child Welfare Centers in Argentina. Eduardo and E. A. Zawels.—p. 1591.

Recurrence of Tubal Pregnancy in Stump of Excised Tube After Three Years.—Three years after the performance of an oophorosalpingectomy of the right side, in a ruptured tubal pregnancy, the patient of Bello et al., aged 32, was brought to the hospital in an emergency condition with the diagnosis of ruptured extra-uterine pregnancy. The general condition was grave. When the second laparotomy was performed a large amount of foul smelling blood escaped. In the stump of the excised tube (in the intramural portion of the tube) a hematoma was found, and at its insertion placental tissue was discovered. A yellow body and chorionic villi were also present. The chorionic villi, in the stump of the right tube, had undergone degeneration. The transverse section of the villi showed a compact mass of cells of trophoblast. The authors believe that the ovum from the left ovary migrated to the right side. They emphasize the importance of total resection of the entire tube, including its intraparietal portion, as the necessary operation in cases of tubal pregnancy, in order to avoid either the recurrence of tubal pregnancy or the possibility of malignant degeneration.

Medicosocial Protection of Mothers in Russia.—Pérez states that the conditions of mothers (especially unwedded mothers) and of infants have improved in Russia during the last few years. He reviews several phases of social insurance and governmental aid for proletarian women and their infants. The author claims that, because of the establishment of welfare centers devoted to the care and protection of mothers and infants, the general mortality, which during the period of 1911 to 1914 was 28.6 per thousand, diminished in 1925 to 23.9 per thousand, and the infant mortality, which during the same period was 26 per cent, diminished in 1926 to 19 per cent (and in the large cities to the even lower percentages of from 11.3 to 13.4). The rate of births over deaths in 1925 was 21.1 per thousand. Russia thus represents one of the countries in which the population increases rapidly. In 1928, Russia had 868 infant shelters, 114 welfare centers for mothers and their children, 348 asylums for children, eleven asylums for unwedded expectant mothers, 708 free dispensaries for children, 485 dispensaries for pregnant woman, 140 dispensaries for medicolegal work, 549 dispensaries transportable for campaign purposes, and 12,221 beds for delivering women, while in 1917 the country had only 5,280 beds for that purpose.

Cerebrospinal Meningitis: Early Diagnosis.—In fourteen of seventeen cases of cerebrospinal meningitis which Miyara and Basso observed in patients aged from 9 to 70 years, the disease was manifested by a sensory polyneuritis (located at the cervical plexus and at the lumbar and sacral plexus), associated with a septicemic picture, which association the authors describe as a "painful septicemia." In the authors' cases the appearance of sensory polyneuritis at the onset of the cerebrospinal meningitis was so constant that they consider it of diagnostic value. As soon as the authors observed this symptom they made the first lumbar puncture for the bacteriologic examination of the cerebrospinal fluid. At the same time that the first lumbar puncture was made, in which the authors withdrew 30 or 40 cc. of cerebrospinal fluid, they made the first intraspinal injection of 40 or 50 cc. of an antimeningococcus serum. So long as the cerebrospinal fluid was positive for meningococcus, injections were given daily, when the condition of the patient permitted it. In these cases polyneuritis improved under the treatment soon after the second injection, and by the fourth or fifth injection it disappeared. The authors say that the good results in their cases (fourteen patients recovered out of seventeen treated) were due to the early diagnosis and to the intensive serotherapy.

Phrenicectomy in Hemoptysis of Tuberculous Patients.—Bertotto and Dal Lago obtained good results by phrenicectomy on the pathologic side in two cases of recurrent hemoptysis in tuberculous patients, aged 37 and 42, in whom artificial pneumothorax could not be induced. In these patients phrenicectomy showed a marked hemostatic action, in spite of the fact that the patients could not lead a sedentary life and that

they had some lesions in the other lung. The patients improved and, six months after the performance of phrenicectomy, hemoptysis had not yet appeared.

Deutsche medizinische Wochenschrift, Berlin

56: 1-40 (Jan. 3) 1930

Conception of Disease in Psychopathology and in Medical Practice. M. Reichardt.—p. 1. C'td.
*Egg Soup in Feeding of Infants. W. Stoeltzner.—p. 4.
Investigations on Efficacy of Prophylactic Ointments for Prevention of Syphilis. E. Zurhelle.—p. 7.
Medication with Codeine Developing into Codeine Addiction. H. Schwarz. —p. 8.
Idem. P. Wolff.—p. 10.
Cancer of Foot Developing from Diffuse Idiopathic Atrophy of Skin. W. Kressin.—p. 12.
Dosage in Medication with Viosterol. S. Wolff.—p. 12.
Case for Sterile Transportation of Cystoscopes and Catheters. W. Schöndorff.—p. 13.

Egg Soup in Feeding of Infants.—Stoeltzner directs attention to the fact that, during recent years, eggs have been almost completely excluded from the diet of nurslings. He asserts that an occasionally observed idiosyncrasy, diarrhea, increase in temperature or collapse are the reasons for the elimination of eggs from infant feeding. It was found, however, that the toxic effects of eggs may be avoided, even in susceptible children, by giving only hard boiled ones. Raw or soft boiled eggs should not be given to children. In other countries, particularly in England, egg yolks have long been considered as an antirachitic food. In recent years American and Swedish authors likewise have stressed the antirachitic value of the egg yolk. Further attention is directed to an article by a pediatrician in Finland, who gained good results by feeding infants with an egg soup. This pediatrician recommended the egg soup particularly for the treatment of acute and chronic diarrhea, and because these conditions may be treated with other methods, his article received little consideration. However, there are other factors that make eggs a valuable addition to infant food. While milk contains only those nutritional constituents that are required for the postnatal period, the egg contains substances also that the fetus receives during the prenatal period. For this reason, eggs are valuable particularly for the feeding of weak and of premature infants. The egg soup recommended by the author is prepared in the following manner. A gruel is prepared with 10 Gm. of fine corn flour and 0.5 liter of water. To this is added 0.5 liter of fresh milk and 60 Gm. of sugar. This mixture is boiled for a short time and after that it is stirred into a beaten egg. Then the egg soup is strained and left to cool. Before each feeding the necessary quantity is heated. The use of this egg soup has brought good results. Harmful effects were not noted. All nurslings who received the egg soup were weak or premature infants, but none of them developed rickets, in spite of the fact that medication with viosterol or ultraviolet irradiation had been omitted. After completion of the treatment, the children had a normal hemoglobin content and a normal erythrocyte count. This indicates that in weak and premature infants the egg soup prevents not only rickets but also anemia. The weight curves showed a sufficient increase. In conclusion the author stresses that egg soup should not be considered as a substitute for breast feeding. For normal infants mother's milk is the best nutriment.

Medizinische Klinik, Berlin

26: 41-76 (Jan. 10) 1930

Incorrect Diagnosis and Incorrect Treatment in Disorders of Ears and Upper Air Passages. P. Stenger.—p. 41.
Occupational Cataracts. A. Elschnig.—p. 43.
Early and Differential Diagnosis of Cerebral Tumors. R. Schmidt.—p. 45. C'cn.
Similar Therapeutic Results with Heart Hormone Preparation and with Muscle Extract. K. Fahrenkamp and H. Schneider.—p. 48.
Coli Serum in Treatment of Peritonitis. Von Petrykowski.—p. 50.
Paroxysmal Hemoglobinuria: Symptomatology. K. Paschkis.—p. 51.
*Extraperitoneal Chronic Appendicitis. B. Cohn.—p. 54.
Renal Threshold for Elimination of Sugar, Estimated According to Height of Sugar Content in Arterial Blood. O. Klein and J. Heinemann.—p. 55.

Extraperitoneal Chronic Appendicitis: Diagnosis.—Cohn directs attention to the fact that in some patients with appendicitis a flexion of the right leg may be noted. This is a protective reflex. It shows that the patient aims to reduce the painfulness. The symptom indicates that the inflammation is near the psoas muscle. This is the case either in periappendicitis, when those tissues are affected that surround the appendix, or in instances in which the appendix is outside the peritoneum. The author describes two cases of chronic appendicitis in which the patients complained of pains during walking and especially when climbing stairs. In the first case the appendix could not be found during the operation. In the second instance it was found that the appendix passed through an opening in the peritoneum and was outside the peritoneal cavity. The author reviews several theories concerning the development of the extraperitoneal appendix but does not reach a definite conclusion. His views on the diagnosis of extraperitoneal appendicitis are summed up as follows: In acute appendicitis the flexion of the right leg and pains in the region of the psoas muscle indicates either a periappendicitis or an extraperitoneal location of the appendix. When in chronic appendicitis the patient complains of pains during walking and when climbing stairs, this is an indication of an extraperitoneal location of the appendix.

Monatsschrift für Kinderheilkunde, Leipzig

45: 289-380 (Nov.) 1929

Automatically Regulated Apparatus for Warming Bottles of Milk. L. Moll.—p. 289.
*Inunctions with Shaving Brush. L. Moll.—p. 293.
Thrombosis of Splenic Vein in Children. E. Holzmann.—p. 294.
Digestive Tract in the New-Born: Anatomy and Physiology. G. Albano. —p. 306.
Colloid-Osmotic Pressure of Blood in Nurslings. A. Mazzeo.—p. 318.
Infectious Genesis of Acute Lymphatic Leukemia. E. Jungbluth.—p. 323.
Typhoid and Paratyphoid in Children. H. Mommsen.—p. 331.

Inunctions with Shaving Brush.—In the treatment of syphilis in infants, Moll recommends mercury inunctions performed with a shaving brush. The pyodermias that are sometimes produced when mercury ointment is rubbed into the skin with the hand are avoided by the use of a shaving brush. Before each inunction the brush is sterilized. The method is particularly valuable in the treatment of syphilis in infants in hospitals because it protects the nurses against infection. The author has found the method efficacious also in the treatment of scabies with an ointment containing sulphur and tar and in percutaneous immunization (Löwenstein) against diphtheria.

Münchener medizinische Wochenschrift, Munich

77: 1-48 (Jan. 3) 1930

Correction of All Errors of Refraction of Eye by Means of Adherent Lens Worn Underneath the Lids. L. Heine.—p. 6.
Tonus of Nerves of Heart and of Blood Vessels in Relation to High Blood Pressure. H. E. Hering.—p. 7.
Influence of Perorally Administered Insulin on Blood Sugar. T. Brugsch and H. H sters.—p. 8.
*Determination of Basal Metabolism in Hypertension. W. Bröcker and W. Kempmann.—p. 8.
Duration of Latent Periods in Syphilis. A. Poehlmann.—p. 10.
Causes and Treatment of Toxic Collapse. E. Holzbach.—p. 11.
Toxicology of Chemical Substances Used in Preservation of Foods: *p*-Chlorobenzoic Acid and Ester of *p*-Oxybenzoic Acid. K. Schübel. —p. 13.
*Treatment of Gangrenous Forms of Mastitis with Ultraviolet Rays. H. Küstner.—p. 14.
Treatment of Bronchopneumonia During Early Childhood. K. Ochsenius. —p. 15.
Gold Therapy in Lupus Erythematosus and in Tuberculides. F. Wirz. —p. 17.
Abscess Formation in Testes in Gonorrhea. O. Salomon.—p. 18.
Raw Diet in Feeding of Nurslings. M. E. Bircher.—p. 19.
Solution of Secondary Butylbromopropenylbarbituric Acid (Pernocton) in Treatment of Morphine Addiction. B. Herold.—p. 20.

Determination of Basal Metabolism in Hypertension.—Bröcker and Kempmann determined the basal metabolism of patients with high blood pressure. The tests were made with Krogh's apparatus. For three days preceding the examination, the patients were put on a restricted protein diet. The tests were made while the patients were still fasting and after a two hour rest period. In order to verify the results of the examinations, they were repeated several times during the succeeding days. Eleven of the seventeen patients with high blood pressure had arteriosclerotic contracted kidney, three had chronic nephritis and three had essential hypertension without renal disturbances. All these patients were free from other complications that

might influence the basal metabolism, such as disorders of the thyroid or febrile diseases. It was found that in all cases of hypertension which were caused by contracted kidney, the basal metabolism was considerably increased, in some instances up to 55 per cent. However, a parallelism between the height of the blood pressure and the height of the basal metabolism was not noted, nor was the increase in the basal metabolism in direct proportion to the severity of the renal disturbance. Of the three cases of chronic nephritis only one showed a slight increase in the basal metabolism. Of the three patients with essential hypertension and without renal disorders, two showed an increase in the basal metabolic rate of 22 and 30 per cent, respectively, whereas the third had a normal oxygen consumption. In the last part of the article the authors discuss several theories concerning the nature and the etiology of the increased basal metabolic rate in patients with high blood pressure. They assume that the high blood pressure as well as the increased basal metabolism are probably caused by disturbances in the central nervous regulation of the mechanisms of circulation and of metabolism.

Treatment of Gangrenous Forms of Mastitis with Ultraviolet Rays.—Küstner states that the treatment of mastitis often presents a difficult problem. He criticizes the method formerly employed which provided different therapeutic measures for the interstitial and the parenchymatous forms. It is also pointed out that if an infection of the mammary gland has become manifest, the application of ice is usually no longer effective. The shortcomings of the surgical treatment are discussed. The author reports one case which had a fatal outcome. Later, when in three other cases the surgical treatment alone did not bring the desired results, the author employed quartz lamp irradiations. For from one and one-half to two minutes daily, the breast was irradiated with the quartz lamp at a distance of 1 meter. Within twenty-four hours after the first irradiation changes were noted. The bluish red discoloration around the gangrenous area became pink. On the following day the skin began to peel off. In all, six irradiations were required to overcome the infectious process. Because large skin defects had developed, transplantation was at first considered necessary. However, when ointments were applied and hyperemia was produced, the healing progressed rapidly. In all three patients the wounds healed without the aid of plastic surgery. The author thinks that the good results of quartz lamp irradiations are due to two factors: 1. The ultraviolet rays have a bactericidal effect on the micro-organisms of gangrenous mastitis, such as pus cocci and putrefactive bacteria. 2. The irradiation produces hyperemia and strengthens the tissues. The author recommends quartz lamp treatment for all wounds that are refractory to treatment, and particularly for gangrenous mastitis.

Wiener klinische Wochenschrift, Vienna

42: 1653-1684 (Dec. 26) 1929

Results of Combined Operative and Radium Therapy in Otorhinolaryngologic Clinic During the Last Ten Years. M. Hajek.—p. 1653.
Criticism of Surgical Methods in Cancer of Mamma. J. Schnitzler.—p. 1656.
*Causal Parasite of Cancer in Mice. M. M. Newiadomsky.—p. 1661.
Symptomatology of Persistent Ductus Arteriosus. P. T. Kasakoff.—p. 1661.
*Medication with Mercury as Cause of Chronic Mercury Poisoning in a Syphilophobic Individual. A. Adler.—p. 1666.
Inflammatory Diseases of Female Genitalia. J. Fabricius.—p. 1666.

Causal Parasite of Cancer in Mice.—Newiadomsky asserts that in former investigations he demonstrated that cancers may be produced by means of filtrates, autolysates and blood. The inoculation was always done intraperitoneally with Ehrlich's strain. Simultaneously with the malignant growths there developed sometimes hemorrhagic exudates. They contained cancerous substances and the cytologic examination revealed the presence of a parasite, *Gregarina*. In numerous exudates that were examined by the author, *Gregarina* could be found in various stages of development. Examination of 125 cancerous growths revealed the entire cycle of development of the parasite. Consequently the author considers *Gregarina* the causal parasite of cancer in mice. He believes that carcinoma in human beings and in rats (Flexner-Jobling's strain) is likewise caused by *Gregarina*. However, the course of development differs somewhat from that in mice. Sarcoma is likewise caused by the same parasite.

Medication with Mercury as Cause of Chronic Mercury Poisoning in a Syphilophobic Individual.—Adler reports the case of a man, aged 52, who at the age of 24 had had an ulceration on the penis with subsequent suppuration of the inguinal lymph nodes. At that time the physician had thought of syphilitic infection. Six years later the newborn son of this man had shown a cutaneous eruption, which disappeared after a short time. Nevertheless, a syphilis infection was again thought of. In spite of the fact that the Wassermann reaction gave negative results, the man underwent antisyphilitic treatment. For twenty-two years he took yearly several treatments of mercury inunctions, and mild mercurous chloride was taken internally. He also had arsphenamine and iodine treatments. During the first years of the mercury therapy he had occasionally been subject to gastric disturbances and to enteritis. In later years psychic changes became manifest. The patient was irritable, distracted and forgetful and often in a state of anxiety. He also was subject to insomnia, had attacks of vertigo, felt weak and steadily lost weight. Recently, tremor had become noticeable, first in the right and then in the left arm, and gradually it spread also to the lower extremities. At this stage the patient entered the clinic. The Wassermann test gave negative results in the blood as well as in the cerebrospinal fluid. In the urine mercury was found, although it had not been administered during the past five weeks. On the basis of this observation the condition was diagnosed as chronic mercury poisoning, resulting from medication with mercury preparations. It is probable that the man had never had syphilis. The clinical aspects of this case were like those noted in occupational mercury poisoning. The patient was advised to discontinue the mercury treatments. Several months later most of the symptoms had disappeared.

43: 1-32 (Jan. 2) 1930

*Endemic Goiter and Myxedema. J. Wagner-Jauregg.—p. 1.
*Misuse of Alcohol as Cause of Accidents. A. Eiselsberg.—p. 6.
Surgical Treatment of Malignant Tumors. E. Ranzi.—p. 7. C'td.
*Combating of Inoperability of Cancer. W. Denk.—p. 10.
Combating of Inoperability of Cancer in Otorhinolaryngology. J. Zange.—p. 12.
Combating of Inoperability of Cancer of Uterus. E. Knauer.—p. 14.
Obstetrics: Unimportance of Constitutional Factors. F. Kermauner.—p. 14.
Heart and Circulation in Pulmonary Emphysema. N. Jagić.—p. 18.
Anorexia in Infants: Treatment. A. Reuss.—p. 19.

Endemic Goiter and Myxedema.—Wagner-Jauregg differentiates between two types of goiter, the one that is endemic in mountainous regions such as the Alps, and the one that occurs at lower altitudes, especially in oceanic regions. The goiter which develops in inhabitants of the lowlands is usually rich in colloids, while the Alpine goiter is parenchymatous and, especially during the developmental stage, is deficient in colloids. The parenchymatous form of goiter does not occur in the lowlands. Goiter of the new-born is not observed at low altitudes, whereas in the Alps it occurs often. Hyperthyreosis is frequent in patients with colloid goiter, however; cretinism does not develop in the lowlands. Patients with colloid goiter are highly susceptible to iodine. The nodules which frequently form in colloid goiters are never of a parenchymatous structure. It is also pointed out that in the first years following the World War goiter became more frequent. It developed even in those regions in which it was not endemic. The author further reviews the literature on the etiology of goiter, and on the prophylaxis and treatment of goiter by means of iodine. He also considers the rôle of heredity and of nutrition in the pathogenesis of goiter. In discussing myxedema, or endemic cretinism, the author stresses its relation to the thyroid. He considers the pathogenesis of cretinism in connection with certain symptoms.

Misuse of Alcohol as Cause of Accidents.—Eiselsberg calls attention to the injurious effects on health caused by the misuse of alcohol. Psychiatrists observe a great number of persons who, as the result of alcoholism, become inmates of insane asylums. Many disorders of the gastro-intestinal tract and of other abdominal organs may likewise be traced to the misuse of alcohol. The author describes several cases of

serious injuries of intoxicated persons, and he asserts that of 32,735 accidents, 553 were due to intoxication. He then points out the great expenditure of public funds and the annoyance which is frequently caused by such accidents. He advocates that intoxication itself should be considered a penal offense rather than an extenuating circumstance in the punishment of crime committed by intoxicated persons. Society should outlaw intoxication by considering it a disgrace and beneath human dignity. Physicians particularly should aid in the combat against alcoholism by directing public attention to the harmful effects on health.

Combating Inoperability of Cancer.—Denk points out that about 50 per cent of all patients with cancer who are brought to the surgeon are in an inoperable condition. The reason for this is that, at least in the beginning stage, cancerous growths often cause little pain, and the symptoms are so insignificant that they are not readily recognized. Moreover, many patients neglect to consult a competent physician, and lose valuable time with quacks. On the other hand, the practitioner sometimes overlooks symptoms of cancer because he does not examine the patient thoroughly. In order to prevent about half of all cancer patients from coming too late for effective surgical treatment, the author recommends various measures. Visiting nurses should aid in the detection of cancer by inducing the people to consult a physician early. The medical press should help the practitioners in better recognizing cancer by issuing pamphlets that deal with the symptomatology and diagnosis of cancer of the various organs. This literature should be distributed regularly, and postgraduate courses should likewise stress the great significance of an early diagnosis and the necessity of early operative treatment.

Zeitschrift f. d. ges. experimentelle Medizin, Berlin

67: 571-830 (Nov. 9) 1929

*Cardiac Decompensation: Fatigue Curve of Muscle. H. E. Büttner.—p. 571.
Morphologic Changes in Renal Epithelium in Venous Stasis. E. Lipsky.—p. 582.
*Prolonged Low Protein Diet. B. Süsskind.—p. 592.
Changes in Blood Following Injection of Bacterial Substances. F. Hoff.—p. 615.
Measurement of Hydrogen Ion Concentration in Small Quantities of Biologic Fluids. E. Raab.—p. 666.
Simultaneous Determination of Direct and Indirect Bilirubin Content of Blood. U. De Castro.—p. 673.
Protein Therapy. L. K. Wolff.—p. 683.
Determination of Pressure on Wall of Artery in Bloodless Measurement of Blood Pressure. A. Müller.—p. 698.
Changes in Volume of Heart and in Blood Pressure in Rapid Introduction of Small Quantities of Isotonic Fluid into Circulation. A. T. Alexandrow.—p. 723.
Metabolism and Blood Vessel Reactions in Surviving Human Placenta. G. Budelmann.—p. 731.
Actions of Colloidal Metals. W. Weichardt and H. Unger.—p. 746.
Normal Human Heart Sound Picture. E. Schütz.—p. 751.
Substances in Blood That Reduce Surface Tension of Water. M. Goldwasser.—p. 763.
*Rôle of Musculature in Regulation of Blood Sugar. G. Hetényi.—p. 772.
Action of Normal Urine on Isolated Frog's Heart. A. Hartwich and H. Kerger.—p. 783.
Resorption of Insulin. F. Gebhardt and G. Fricke.—p. 806.
Changes in Average Respiratory Capacity in Stenosis of Upper Respiratory Tract. K. Thiel.—p. 810.
Absence of Work Hypertrophy of Heart in Castrated and in Splenectomized Dogs. Külbs.—p. 822.

Cardiac Decompensation: Fatigue Curve of Muscle.—In a study of the contraction curve of muscle in twelve healthy persons, five persons with noncardiac diseases, eight persons with compensated cardiac disease and eighteen persons with cardiac decompensation, Büttner noted that, contrary to what occurs in healthy persons following work and subsequent electrical stimulation of a muscle (gastrocnemius), in most persons with cardiac decompensation the muscle soon shows a marked fatigue curve. He believes that this observation indicates that in cardiac decompensation the metabolism in the muscles is pathologic.

Prolonged Low Protein Diet: Effects.—Süsskind studied the effects on himself of a low protein diet maintained for twenty-five months. During the first nine months his weight remained stationary and he noted an improvement in his general condition. During the next eleven months his weight decreased slightly and he felt weak. During the last five months of the experiment his weight decreased still more and his general condition became poor. On the basis of his personal experience the author believes that a prolonged low protein diet is harmful and that observations to the contrary are erroneous.

Rôle of Musculature in Regulation of Blood Sugar.—In experiments on rabbits and dogs Hetényi demonstrated that when the amount of sugar consumed by the muscles is increased there forms in the latter a substance that causes mobilization of the sugar in the liver, thereby preventing a decrease in the sugar content of the blood and a decrease in the glycogen reserve of the muscles. He states that a substance with a similar action (perhaps the same substance) can also be demonstrated in resting muscle from animals with pancreatic diabetes; this observation lends additional support to the omnicellular peripheral theory of diabetes mellitus.

Nederlandsch Maandschrift voor Geneeskunde, Leyden

16: 243-299, 1929

*Treatment of Rickets with Viosterol. J. C. Schippers.—p. 243.
Parenteral Administration of B C G Vaccine. H. D. Boer.—p. 250.

Treatment of Rickets with Viosterol. — Schippers employed viosterol in a number of infants with rickets and secured excellent results. He found that measles had a very unfavorable influence on rickets and delayed the action of viosterol. In one case in which bronchopneumonia had preceded the onset of rickets, the action of viosterol was more rapid than in the case of measles. Cranial rickets yielded rapidly to the treatment. The author holds that viosterol should be given only on the basis of definite indications; for instance, when cod liver oil with phosphorus is not well borne (eczemas, strophulus, intestinal disturbances) or when children stubbornly refuse to take it, which he finds is seldom the case.

Hygiea, Stockholm

91: 801-832 (Dec. 15) 1929

*Jaundice Due to Cinchophen. N. Liedberg.—p. 801.

Jaundice Due to Cinchophen.—Liedberg reviews twenty-nine cases from the literature of jaundice caused by cinchophen or its derivatives and publishes two additional cases. In twenty-nine of these instances a cinchophen preparation was used in therapy, in five a cinchophen preparation was used as a contrast substance in cholecystography. Of the total thirty-one cases, eleven were fatal; in six of these necropsy disclosed acute yellow atrophy of the liver.

Ugeskrift for Læger, Copenhagen

92: 1-30 (Jan. 2) 1930

*Peculiar Condition in Head of Humerus Resembling Calvé-Perthes Disease of Hip Joint. H. J. Panner.—p. 1.
Burns. S. Widerøe.—p. 4.
*Eosinophilia in Liver Diet. E. Meulengracht and S. Holm.—p. 7.
Apparent Death Together with Significance of Carefully Performed Necropsy and Properly Filled-In Death Certificates. J. Fog.—p. 11.

Peculiar Condition in Head of Humerus Resembling Calvé-Perthes Disease of Hip Joint.—In Panner's three cases, in children aged 10 or less, the symptoms followed a definite trauma. Roentgen examination revealed characteristic changes in the structure of the head of the humerus, slight in the first stage, showing atrophy and rarefaction in the florid stage. After a variable period return to the normal condition was seen, with apparently complete restitution (in the first case not until after three years). Treatment consisted only in guarding the arm, as by exemption from gymnastics.

Eosinophilia on Liver Diet.—Meulengracht and Holm report eosinophilia in marked form in all cases of pernicious anemia treated with raw calf's liver in large doses. The eosinophilia usually appeared suddenly after about four weeks' treatment and seemed constant during the use of the raw liver. In cases treated with lightly broiled calf's liver or liver extract the phenomenon was as a rule absent. Control patients with other pathologic conditions reacted similarly to patients with pernicious anemia.